

CTO

DECEMBER 1, 1996

EIGHT DOLLARS

BELGIUM BF240

FRANCE FR40

GERMANY DM12

ITALY L13,000

JAPAN ¥780

NETHERLANDS G13

SPAIN P1000

SWITZERLAND SFR10

UNITED KINGDOM £5

THE MAGAZINE FOR INFORMATION EXECUTIVES

UNTANGLING SYSTEMS COMPLEXITY

**Can Message Brokering
Save You From
Integration Paralysis?**

PAGE 54

ALSO
**How To Be
Your Company's
Most Valued
Consultant**

PAGE 40

Clint Petty
advocates the
message-brokering
approach

AN INTERNATIONAL DATA GROUP PUBLICATION

An aerial, black and white photograph of a baseball field, showing the diamond and the surrounding grass. The image is grainy and has a high-contrast, textured appearance. Overlaid on this image is large, bold, red text that reads: "You manage things at a market." The text is arranged in four lines: "You", "manage", "things", and "at a market." The word "market." is on the fourth line and is the largest, spanning most of the width of the page.

You manage things at a market.

The other is information. Because no trade would ever be made without it. And helping clients manage information—not just process it—is what Unisys does best. That's why Unisys solutions are trusted for the most demanding jobs—like trading over 800 million shares in a

single day. Unisys systems support 500 transactions a second, transmitting details to over 3,000 workstations. And Unisys is behind everything from managing a quotation database to maintaining the world's first "electronic trading floor." It's all part of information management—our way of

eed two D run stock

One of them is stocks.

helping you use information as an asset to gain competitive advantage. Call for details and learn what clients like The Nasdaq Stock Market learned. When it takes information to run your business, it takes Unisys to help you run it better.
<http://www.unisys.com> or 1-800-874-8647, ext. 222

UNISYS

When information is everything.



Desktop
management costs.
Control them
while you can.

Faster **Simpler**
NETWORKS

Imagine where your business would be without the PC. It has become one of your most valuable business tools. But it's also becoming one of your most costly to manage. Ever since PCs have been networked, the cost of managing them has grown like a weed.

The trick is to control these costs now. Which is exactly what Intel LANDesk® Management products can help you do.

Intel's award-winning, integrated suite of products gives you all the tools you need—software distribution, virus protection, monitoring, alerting,

PROUD PARTNER

150
1846 1996
Smithsonian

reporting, metering and remote access—together with a single interface. Plus, our two new products let you deploy standardized PC configurations and optimize your help desk so your staff can solve problems quicker and save valuable senior IS resources.

The integration of the LANDesk

Management products translates to simpler management and fewer hours invested in problem solving. You'll not only increase your network uptime, you'll lower your total cost of desktop management.

Visit our site at www.intel.com/comm-net/sns/turn/cio4.htm or

give us a call at 1-800-538-3373, ext. 816 to learn more about how Intel can lower your business computing costs. Before they grow way beyond control.

intel®



Who Says You Can't Win 'Em All?

It's not often that all the leading industry magazines agree on anything.

But then again, it's not often that a product like CA-Unicenter comes along. In virtually every product review, every category, every leading industry magazine, CA-Unicenter is rated #1. That's why it's become the industry standard for enterprise management. And why over 50% of CIOs surveyed by *CIO Magazine* said they plan to purchase CA-Unicenter during the next 12 months.

For More Information On CA-Unicenter TNG, Call 1-800-225-5224 Or Visit Us At <http://www.cai.com>

Call right now for the information that will win you over too.



CA-Unicenter® TNG™

Inside CIO

VOLUME 10 • NUMBER 5 • DECEMBER 1, 1996

Cover Story:

The Integration Backlash

PART 2: MESSAGE BROKERING

54 A Smarter Linking Logic

Message brokering just might be the future of systems integration. *By Christopher Koch*

PART 3: MESSAGE-BROKERING PROFILES

64 Proven Returns

MCI and Prudential have derived substantial business benefits—and cost savings—from a message brokering infrastructure. *By Christopher Koch*

Features

THE CIO ROLE

40 The Missing Piece

It's not enough anymore for CIOs to have good management and technical skills. There's yet another requirement to add to the puzzle: "consulting skills." *By Tom Field*

CORPORATE TURNAROUND

70 Remodeling Sears

The country's third-largest retailer is back with new blood at the top and a whole new way of looking at IS. *By Daniel Gross*

QUALITY STANDARDS

78 Automatic Standards

Suppliers to the Big Three automakers are being forced to comply with mandatory quality standards. Their plight could foreshadow what lies ahead for other industries. *By Jennifer Bresnahan*



In Every Issue

IN BOX 10

Letter from the editor, reader feedback, how to reach us



18/ Publisher's Note

TRENDLINES 20

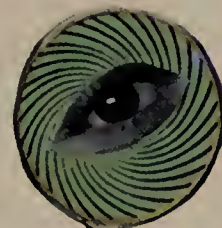
20/ Here's Looking at You, Kid
Surveillance in the workplace

22/ No-Stop Shopping
Executive stocking stuffers

28/ Keeping Watch
IT aid for abused children

PLUS/ Off the shelf, travel management software, career moves, guide to computer security

INDEX 118



20

40

MORE >>>

Partnership³



**Computerworld's
vendor confidence survey shows
greater customer satisfaction with
3Com products and services than
with any of their competitors.*

Please call us and we'll gladly
provide you with reprints of the
article which quantifies the
advantages of 3Com networks, or
you may access the information
directly on our website.

©1996 3Com Corporation. 3Com is a registered trademark
of 3Com Corporation. All other trademarks are those of
their respective owners.

3Com					
Cabletron					
Bay Networks					
Cisco					
IBM					
A	17	13	10	10	9
B	4	12	9	11	11
C	9	5	10	9	10
D	0	0	1	0	0

*Where should your enterprise
communications strategy begin:*

Heaven or Earth?

*By knowing networks from the ground up,
3Com is delivering solutions for the real world.*

Precious few companies have mastered advanced computer networking. And of those, only one began where the rubber, as they say, meets the road: at the user level. In fact, 3Com has connected more than 42 million users to networks around the world.

Knowing how networks work at every level compels 3Com to develop more than the big switches and routers used to run Fortune 500 global systems. 3Com network solutions deliver the consistent application response time critical to businesses of today like banks, healthcare providers and, not surprisingly, other major technology companies. If you are among these companies, contact 3Com. With a stellar reputation* for reliability, value,

1-800-NET-3Com
(option 4)

www.3com.com/earth

follow-through, and solutions that are easily implemented, 3Com can undoubtedly put your network on a solid footing.



Inside CIO

CONTINUED

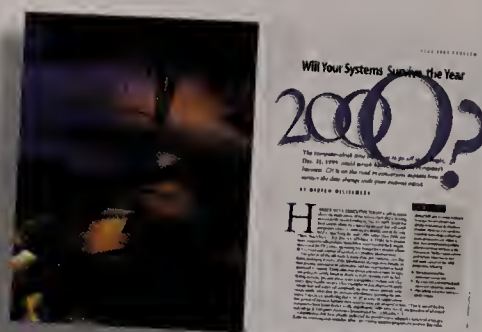
Features, continued

STORY INDEX

88 The Year in Review

An index of all major articles published in *CIO* in 1996, including a cross-reference by article type.

106



Columns

FORRESTER VIEW

32 Money Mastery

Digging for dollars is a key skill for high-performance CIOs. *By Russ Maney and Julie Horkan Meringer*



YEAR 2000 ONLINE FORUM

106 Further Discussions

Excerpts from *CIO*'s second online feature forum.

EMERGING TECHNOLOGY

110 Groupware Imaging

Groupware and intranets are changing the image of imaging. *By John Edwards*



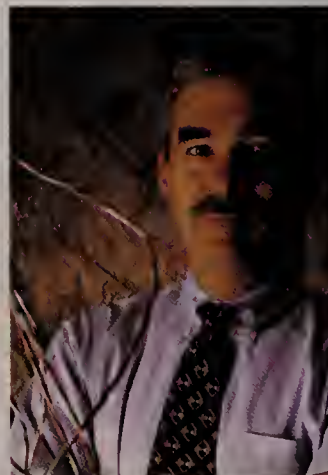
- 3-D visualization
- Data mining for marketers, enterprise drawing applications, entry-level voice mail

WORKING SMART

120 Michigan Employment Security Commission

This agency calls on interactive voice response technology to streamline the claims process. *By Megan Santosus*

54 *Clint Petty of DCMS Inc. has a message for you.*
Cover photo by Walter Calahan



New On Our Web Site

cio.com
<http://www.cio.com>

LOOKING BACK

The CIO Archive Search our collection of *CIO* feature articles dating back to September 1994.

www.cio.com/ciomag/archive/cio_index.html

STILL TALKING

Our recent **Online Feature Forums** are continuing indefinitely due to popular demand. Find out what people are saying about the **Year 2000** date conversion (www.cio.com/forums/year2k.html), the **Webmaster's Role** (www.web-master.com/forums/career.html) and **SAP R/3 Enterprise Software** (www.cio.com/forums/SAP.html).

WEB SMARTS

Online Seminars Visit our ongoing series of seminars on hot topics like using the Web as a business tool and benefiting from an intranet.

www.cio.com/ciomag/seminars/seminars.html



Board Chairman
PATRICK J. MCGOVERN

President
KELLY CONLIN

Chief Operating Officer
JAMES CASELLA

Executive Vice President
WILLIAM P. MURPHY

BUSINESS GROWING FASTER THAN TECHNOLOGY CAN KEEP UP?

DECEMBER 14, 1995

THE ULE M ET NG IO
XP SYS AGAIN

CIO: JOHN DOBBS

FEBRUARY 22, 1995

A DUT H W ND ER
S COS S 60

CIO: BARRY WEIL

JANUARY 13, 1994

RE F
P M
O I G S

CIO: JANE McDOUGAL

JULY 12, 1992

R
XP

CIO: ADAM HARLEY

MARCH 7, 1991

CIO: MARY WALKER

OCTOBER 18, 1989

CIO: BOB DICKINSON

CONGRATULATIONS!



IT'S TIME FOR SEQUENT.

In today's process-driven world, it's not whether your business is growing too fast, but whether your ability to do business is growing fast enough. If you're a CIO faced with ever-escalating IT demands, you understand technology's critical role in enabling growth. So do we.

We're Sequent Computer Systems.

The leader in very large, complex open-systems solutions. And, the acknowledged experts in helping companies like yours take the limits off growth.

Sequent's not as big as IBM. Not as famous. But what we bring to the table is a lot more powerful. The ability to accurately diagnose your IT problems. By first understanding your

strategic business issues. The experience to create solutions that really work. Right from the start. The technology to provide for aggressive growth. Now and in the future. The ability to succeed. Even after companies like IBM, DEC, and HP have failed.

With 7,500 installed systems worldwide, Sequent runs some of the biggest, fastest-growing

applications around the globe. Our customers say we're the best at our business. And, we can prove it. To you... to your management team.

Call us at 1-800-257-9044. Visit our internet address at <http://www.sequent.com/>.

SEQUENT
Big Open Systems That Work

In Box

LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

“The most important competency for your information systems staff is leadership.”

What's that? Shouldn't it be client/server or object-oriented or networking skills? Or at least something like project management or customer responsiveness?



Not according to a group of CIOs I spoke with recently. Those folks had some very specific ideas about the role of leadership on an individual level and what that entails.

“A leader takes action and assumes accountability,” said Xerox's Pat Wallington. Those are important characteristics for all members of a working group, from top to bottom. It's often easy for individuals to assume a passive or even a victim's role: waiting for managers (the anointed leaders) to innovate new products or processes and solve all the problems, real or perceived. That doesn't wash in today's flattened organizations. Everyone must pitch in.

They must also be adaptable. “People must learn to learn and learn to change,” said Wallington. If you focus on specific technology skill sets at the expense of those underlying competencies, you'll find yourself with a staff of people with outdated skills every

few years. Teach them how to change, learn and innovate—and especially to view themselves as a central part of the solution—and you'll have a group of people who can help take your company into whatever the next paradigm might be.

Darwin John from the LDS Church believes that to foster leadership, one must set a good example. “The starting point is to change ourselves,” he said. “It's a matter of influence—of transforming the way people think.” He noted that CIOs who complain they don't have a seat at the executive table should stop blaming outside circumstances and instead ask themselves, “What can I do differently” to change this situation? “Permanent change happens when we change ourselves,” John said.

Are you fostering leadership and accountability among your staff? Why don't you share your experiences with the rest of CIO's readers? We'll publish some of your comments in the letters section of a future issue of the magazine. Send your e-mail to letters@cio.com or directly to me.


lundberg@cio.com

FROM OUR READERS

VIRTUAL TRASH

I was extremely pleased to read about the “World Wide Wasteland” in the Oct. 15, 1996, Trendlines section. I am missing Ricki Lake not because of my work schedule but because my office was moved to the other side of the building last year.

My former office overlooks the Ricki Lake studio entrance. My daily view of Ricki coming to work, the audience standing in line for the different tapings, the “worldly” guests being delivered by limo and special guest Richard Simmons in his pink tank top and pink-and-white striped shorts is no more.

Thank goodness for the online talk show Other People's Problems. Now I can log on and pretend I still have the view. Let's call it “virtual trash.”

Bob Duckworth
New York

Anyone Can Put Terabytes In A Box.



The Trick Is Getting Them Out.

Today, your mainframe and open systems users demand more than massive storage capacity. They demand massive access — non-stop, fail-safe and lightning-fast. No small trick. Fortunately, Amdahl makes storage systems to satisfy the most demanding mindsets.

Your open systems users won't mind having unprecedented data access. That's what our new LVS 4000 client/server storage family delivers. Performance that scales up with capacity — to a stunning 20,000 I/Os per second at a full terabyte.

Our Spectris™ storage family puts System/390 users' minds at ease with non-stop data delivery. Through batch and on-line processing, even maintenance. 24 x 365, non-stop performance.

Satisfying demanding users is no trick at all. Just go with Amdahl.

(800) 223-2215. <http://www.amdahl.com>.

©1996 Amdahl Corporation. Amdahl is a registered trademark and Spectris is a trademark of Amdahl Corporation. All other trademarks are property of their respective owners.

amdahl

Microsoft Enterprise **broad-stroke** solutions to



Big problems. Little problems. Each one is different. And each one is unique to your company. Fortunately, Microsoft®, along with our Enterprise Partners, has a solution that will **satisfy your developers and your deadlines**. With Microsoft Visual Basic® programming system you get the first completely RAD tool for distributed client/server development. By adding the unlimited flexibility of the Microsoft Visual C++® development system, you can build any component you need

(If you're short on aplomb, try our 3rd-party partners.)



Microsoft®

Enterprise

Development Partners



Attachmate's EXTRA! Developer Series expands the scope of client/server and intranet applications to include host screens, databases, and logic. Choose from QuickApp, QuickDB, QuickPeer, Quick CICS and Emissary Host Publishing System. Call (800)426-6283 (code 602).
www.attachmate.com



Fujitsu COBOL is a high-performance multi-platform COBOL development suite. The highly optimized code produced by Fujitsu COBOL provides the basis for fast mission-critical business systems on Windows and other platforms.
www.adtools.com



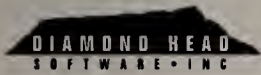
Stop risk in its tracks when deploying mission-critical applications, with Mercury Interactive's automated client/server testing tools: TestDirector, WinRunner, LoadRunner, WebTest and TestSuite. No other tools test better than these.
(800)TEST-911. www.merc-int.com

BLUE SKY SOFTWARE

Award-winning Visual SQL turns Microsoft Visual C++ into a full-blown client/server development environment. Build robust, scalable, high-performance C++ client/server applications on time and on target, without leaving Developer Studio. Also available: RoboHELP, the ultimate Help Authoring tool. Call (800) 793-0440 or visit www.blue-sky.com.



MKS is a leading provider of software products enabling organizations to maximize productivity and effectively manage change to source and content across Internet/intranet, client/server environments, and multiple platforms. Visit our website at www.mks.com.



ImageBASIC is the premier imaging development environment, offering customizable applications and an integrated suite of VBX's and ActiveX Controls. Integration with DOCS OPEN and various optical servers is available. Call (800)428-6657 or visit www.dhs.com.

digital

The Digital Application Generator builds Visual Basic Business Objects as Remote OLE Servers for three-tier applications. Digital provides the widest range of enterprise client/server solutions available today: ODBC, OLE and TP. For more information, send mail to Application-Generator@digital.com to visit us at www.digital.com/Info/ApplicationGenerator. To order, contact Digital at (800)DIGITAL.

RATIONAL
SOFTWARE CORPORATION

Rational Rose/Visual Basic provides object modeling for teams of Visual Basic 4.0 developers building three-tiered enterprise applications. It supports the Booch and OMT object-oriented analysis and design methods and generates code for and reverse engineers Visual Basic 4.0 and ActiveX components. Call (800) 728-1212 or visit www.rational.com.



Using Purify, developers can quickly identify and eliminate programming's toughest errors. Purify automatically pinpoints hard-to-find run-time errors and memory leaks in C and C++ code, including components and ActiveX controls. For more information visit www.pureatria.com.

SIEMENS
NIXDORF

The ComUnity Visual Framework, developed in collaboration with Microsoft, is a tool for building large-scale 3-tier client/server applications using VB4 OLE/ActiveX. It contains tools, code generators, reuseable code, concepts and design rules to create systems that are fully internationalized and maintainable. comunity.sni.de/public/ot/ot.htm



Experience Architected-RAD with Sterling Software's KEY:Workgroup. These integrated tools combine business workflow modeling with data modeling and database design. Using KEY:Workgroup, VB developers architect business-driven solutions for the enterprise. (800)338-4130. www.key.sterling.com



Thin down your fat clients with Vision Builder's unique Application-Business-Data (ABD) rules-driven approach. Unleash the power of Visual Basic and SQL Server while building your applications in a fraction of the time. For more information, visit our Web site at www.vision-soft.com.



Visual Components, Inc. is the leading provider of component-based development tools for building Windows-based applications for the enterprise. Visual Components' tools deliver essential business functionality, encapsulated in tightly built component objects. For more information, visit www.visualcomp.com.



Texas Instruments Software creates competitive advantage by reducing application life-cycle time. Composer,[™] a component-based development tool, enables the assembly and maintenance of client/server systems. Arranger[™] promotes component reuse with Visual Basic applications. Visit www.ti.com/software.

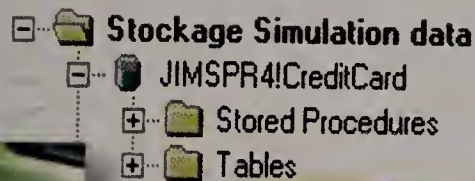


Interested in obtaining access to business-critical information in enterprise networks and beyond, or building custom applications with our ActiveX controls? RUMBA 95/NT does this and more! Preview the RUMBA advantage, (800)817-7997. www.walldata.com

Tools let you apply **one-of-a-kind** **problems** **with** **aplomb.**

(If you're short on aplomb, try our 3rd-party partners.)

Microsoft
Visual Basic



- Stockage Simulation data
 - JIMSPR4!CreditCard
 - Stored Procedures
 - Tables



Microsoft
Visual C++

while generating the fastest enterprise applications. The enterprise editions of both tools have additional features to meet the requirements of large application development. Your developers will **build applications that are scalable, support Internet development and can access databases** of all kinds. Plus, with Visual SourceSafe™ your team will be able to share files, coordinate efforts, and, well, become more team-like. But great application development requires

more than just a great set of coding tools. Our 3rd-party partners deliver tools for data, object, and process modeling; application testing; maintenance; and bug tracking. And since they're **integrated with Visual Basic and Visual C++**, you get the same familiar development environments that will reduce your learning curve. To check out our **Enterprise Partners** and Microsoft Enterprise Tools, see the attached insert or visit us at our website.

Microsoft®

Where do you want to go today?® www.microsoft.com/edevpartner/

In Box

SEEKING SOLUTIONS

I just wanted to congratulate you on a very well-written and informative article ["Making Brain Waves," Jan. 15, 1996]. I read it when it originally came out, and I read it again recently to refresh myself on the concept since my company is looking at various business applications of artificial intelligence (AI) technology.

In the article, you mention the existence of certain "shrinkwrapped" packages. I want to use a package that can help me create neural net models that can take many variables and correlate them to one desired outcome under many different circumstances. Would your readers be able to tell me of any shrinkwrapped packages out there that are not industry specific?

Aseem Mital

Senior Vice President & CIO
Long Beach Mortgage Co.
Orange, Calif.
amital@lbfs.com

A PROGRESSIVE COMPANY

I read with great interest your article on the techniques used by Progressive Insurance Co. to keep people satisfied ["The Stuff Dream Jobs are Made Of," Oct. 15, 1996]. I worked for Progressive for about three months many years ago and left because it seemed to have no interest in utilizing my skills (or even keeping me busy with "make work" for that matter). At the time, it seemed to be

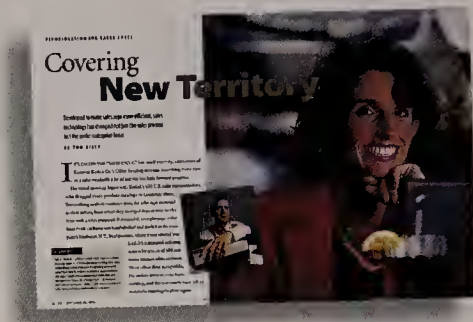
a fairly common occurrence there. It's nice to see a company that can recognize an "intangible" problem and apply a corrective strategy that actually worked. Hats off to Progressive.

Art Benson

Manager, Sales and Marketing Systems
Fruit of the Loom Inc.
Bowling Green, Ky.
abenson@fruit.com

CONSULTANT'S MAXIMS

I could not resist a response to your piece on IT and the selling process ["Covering New Territory," Sept. 15, 1996].



As a consultant in the business of helping organizations apply technology to their sales and marketing challenges, I was

pleased to see that you stressed so many of the typically overlooked aspects of the process. I wish I had a billable hour for every meeting I have been in where the project team has to defend their training or support budget after development is underway.

Naturally, I cannot help but want to add a few of my own observations (that is what we consultants do, right?). Here are a few maxims I try to hammer home early:

■ Using sales productivity as an ROI argument is a career-altering decision. I have installed systems that returned over 40 percent of a representative's time to the sales organization; however, unless management and the sales process can use the time well, the most trackable metric might be lower golf handicaps.

■ Pay attention to the data you collect. What can you do with that data to improve customer relationships that you could not do before? Here is where I invariably find sufficient ROI or revenue lift to justify investments.

■ Engineer the desired impact on the customer's experience first, then the representative's and then the manager's.

I. Barry Goldberg

Matterhorn Consulting Services
San Francisco
barryg@matterhorn-inc.com

How to Reach Us

Phone: 508 872-0080

Fax: 508 879-7784

Address: CIO Communications Inc.,
492 Old Connecticut Path, P.O. Box 9208,
Framingham, MA 01701-9208

Web Site: www.cio.com

E-mail: For staff e-mail addresses, visit
www.cio.com/CIO/editstaff.html

Subscriber Services: 800 788-4605,
Fax: 508 872-8506

Reprints: Reprints are available by
calling 508 935-4539



© CIO Communications, Inc.

President and Group Publisher Joseph L. Levy
Editorial Director Lew McCreary

EDITORIAL

Editor Abbie Lundberg
Managing Editor Richard Pastore
Senior Editor E.B. Baatz
Associate Editors Elaine M. Cummings,
Cheryl Dahle, Alice Dragoon, Perry Glasser
Copy Chief Cheryl R. Davis
Copy Editors Jay F. Rizoli, Sara Shay
Senior Writers Carol Hildebrand,
Christopher Koch, Megan Santosus
Staff Writers Jennifer Bresnahan, Peter Fabris,
Tom Field, Heath Row, Derek Slater
Editorial Researcher Carol Zarrow
Editorial Assistants
Ruth Greenberg, Thomas G. Wailgum
Administrative Assistant Lisa Jayne Kerber

Contributing Editors Leigh Buchanan,
Art Jahnke, Anne Stuart, Miryam Williamson
Contributing Writers
John Edwards, Daniel Gross
Russ Maney, Julie Horkan Meringer

DESIGN

Art and Design Director Mary L. Marshall
Sr. Graphic Designers Linda Golon, Michael Siggins
Graphic Designers Hana Barker,
Steve Traynor, Kelli Walton
Associate Graphic Designer Terri Mitchell
Contributing Assoc. Art Director Lisa Puccio

WEB SITE

Webmaster Tim Horgan
Web Developer Lee Weiner
Web Intern Anya Yungelson

CIRCULATION

VP/Circulation Carol A. Spach
Fulfillment Manager Susan Woodworth
Subscription Svcs. Supervisor Denise Perreault
Circulation Assistant Tina Pescara

PRODUCTION

VP/Production Lori Beth Sadewitz
Production Manager Resa Altsher

EXECUTIVE PROGRAMS

Senior VP/Exec. Programs Lynda Rosenthal
Manager, Program Services Nancy A. O'Connell
Director, Program Planning Susan T. Montgomery
Manager, Program Development Robin L. Azar
Manager, Program Operations Cynthia Laird
Mgr., Program Mktg. Comm. Sara E. McGarry
Program Mktg. Coordinator Jeremy E. Draper
Administrators, Exec. Programs
Liz Hecht, Michael McPhee
Administrative Assistant Sandra J. Hughey
Program Coordinator Brian Fuce
Manager, Ancillary Products Bill Kerber

MARKETING

VP/Marketing Cathy O'Leary Hayes
Director, Marketing Programs Lisa Brown
Research Manager Bridget Cammarata
Marketing Comm. Manager Marcy L. Dill
Trade Show Coordinator Dot Caspersen
Research Specialist Caroline Cerullo
Marketing Comm. Specialist Karen Fogerty

ADMINISTRATION

VP/Finance & Admin. Walter Manninen
Assistant to the Publisher Diane Martin
Office Services Assistant Vivian Kissileff
Billing Coordinator Lynn J. Palmquist
Financial Analyst Chad Marston

INFORMATION SYSTEMS

Chief Information Officer Bruce M. Friedman
Manager, Network Services Didier Weizman
Manager, Desktop Services James C. Burgoyne



Get *free* overnight delivery *from* IBM.

Now IBM gives you faster computers.

Faster monitors. Faster memory. Faster storage. It's called IBM QuickShip. ► Just place your order by 1:00 p.m. eastern time and hundreds of products available through IBM QuickShip, from processors to peripherals, terminals to token rings, monitors to memory, can be delivered overnight for free. Through the end of 1996. ► To place your order, simply call IBM Direct at 1 800 IBM-CALL (1 800 426-2255) and mention priority code YA018. If you'd like to get a complete QuickShip product list by fax, call 1 800 IBM-4FAX (1 800 426-4329) and enter document code 5514216. And visit our Web site at <http://ibm-direct.e-com.ibm.com/us/quickship>. ► With IBM QuickShip, the computer products you need today can be there tomorrow.

Quick
Ship

24 hr.

1 800 IBM-CALL

1 800 426-2255

IBM

Solutions for a small plane



Introducing the
PowerEdge 2100:
Redefining the
entry-level server.

Investment Banks Jump On Public Offering Of Dell Servers

3 of 4 Top Firms Report Improved Network Performance

Wall Street may be feeling a bit queasy, but it's definitely a bull market for Dell.

The Austin, Texas-based computer maker has scored a big hit among some of the largest investment banks with - of all things - its line of PowerEdge servers.

"It might seem surprising," said one source. "When people think of Dell, they think of desktops and portables. But Dell's adherence to open network standards makes their servers a natural on large corporate networks."

It also makes Dell unusual among its competitors, most of whom are only now beginning to abandon their proprietary standards in favor of a more open approach. "I don't want to name names, but companies like Co



The following could be considered insider information. Run with it.

- Dell is ranked fifth in US server market share
- Dell servers are built in a dedicated ISO 9002 server factory
- Mission-critical server support is provided 7 x 24
- 5 of the top 6 software makers buy Dell servers
- 92% of Dell's \$5.8 billion revenues come from businesses and government agencies
- 5 of the 6 largest automobile makers buy from Dell
- 4 of the 5 largest mutual insurance companies buy from Dell
- 5 of the Big Six accounting firms buy from Dell



POWEREDGE 2100 SERVER: SMALL INVESTMENT, BIG RETURNS.

No question, the 2100 is one serious server. Its Pentium® Pro processor-based performance speaks for itself. Its Ultra/Wide SCSI controller speeds up hard-drive access. And, its server management helps maximize uptime. So don't let the low cost fool you. The 2100 will pay you huge dividends.

DELL® POWEREDGE® 2100 SERVER 180MHz PENTIUM® PRO PROCESSOR

- 256KB Integrated L2 Cache
- 32MB ECC EDO Memory (512MB Max.)
- Integrated Adaptec 7880 PCI Ultra/Wide SCSI-3 Controller
- 2GB Fast/Wide SCSI-2 Hard Drive
- 8X SCSI CD-ROM Drive
- 3Com® 10/100 PCI Ethernet Adapter
- Intel® LANDesk™ Server Manager v2.5x
- Includes Microsoft® Windows® NT Server at no additional charge through 12/31/96!
- 3 Year Warranty† including 1 Year NBD On-site[^] Service
- 7 x 24 Dedicated Server Hardware Technical Support

\$3799[†]

Product Code: 200143

DELL POWEREDGE 2100 SERVER 180MHz PENTIUM PRO PROCESSOR

- 256KB Integrated L2 Cache
- 128MB ECC EDO Memory (512MB Max.)
- Integrated Adaptec 7880 PCI Ultra/Wide SCSI-3 Controller
- Two 4GB Fast/Wide SCSI-2 Hard Drives
- 8X SCSI CD-ROM Drive
- 3Com 10/100 PCI Ethernet Adapter
- Intel LANDesk Server Manager v2.5x
- Includes Microsoft Windows NT Server at no additional charge through 12/31/96!
- 3 Year Warranty including 1 Year NBD On-site Service
- 7 x 24 Dedicated Server Hardware Technical Support

\$5799[†]

Product Code: 200145

DELL POWEREDGE 2100 SERVER 180MHz PENTIUM PRO PROCESSOR

- 256KB Integrated L2 Cache
- 64MB ECC EDO Memory (512MB Max.)
- Integrated Adaptec 7880 PCI Ultra/Wide SCSI-3 Controller
- 4GB Fast/Wide SCSI-2 Hard Drive
- 8X SCSI CD-ROM Drive
- 3Com 10/100 PCI Ethernet Adapter
- Intel LANDesk Server Manager v2.5x
- Includes Microsoft Windows NT Server at no additional charge through 12/31/96!
- 3 Year Warranty including 1 Year NBD On-site Service
- 7 x 24 Dedicated Server Hardware Technical Support

\$4399[†]

Product Code: 200144

DELL POWEREDGE 2100 SERVER 180MHz PENTIUM PRO PROCESSOR

- 256KB Integrated L2 Cache
- 128MB ECC EDO Memory (512MB Max.)
- Integrated Adaptec 7880 PCI Ultra/Wide SCSI-3 Controller
- Three 4GB Fast/Wide SCSI-2 Hard Drives
- 8X SCSI CD-ROM Drive
- 3Com 10/100 PCI Ethernet Adapter
- Intel LANDesk Server Manager v2.5x
- Includes Microsoft Windows NT Server at no additional charge through 12/31/96!
- 3 Year Warranty including 1 Year NBD On-site Service
- 7 x 24 Dedicated Server Hardware Technical Support

\$6999[†]

Product Code: 200162

DELL®

800-847-4037

<http://www.dell.com>

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT • Sun 12pm-5pm

In Canada, call 800-839-0148

In Latin America, call 512-728-4685

Keycode #13031

Without notice. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation and is available in 29 metropolitan areas. For more information call Dell's

Publisher's Note

"The systems world in our company is really the glue that holds the company together."

*—Arthur Martinez, CEO
Sears, Roebuck and Co.*

There are two kinds of people in this world: those who worry about how they got into a mess and those who worry about how they'll get out. Fortunately,

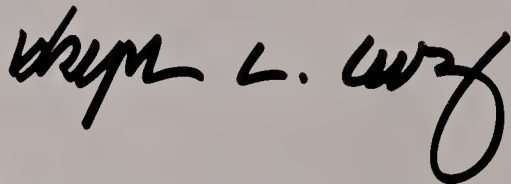
Sears, Roebuck and Co. has the kind of leader who focuses on how to get out of a bad situation.

In 1992, Sears' merchandising division reached a critical juncture—the company was losing \$1.7 billion. CEO Arthur Martinez took a long, hard look at the company's business processes, competitive challenges and functional operations, including the IS organization. With the help of a consultant, Martinez determined that for IS to become more effective, it needed to be elevated in the organization and included in strategic planning. He

swiftly assigned an IS executive to each major business unit and developed a strategic performance reporting system to give authorized employees access to critical sales information.

Those and other changes contributed to Sears' IS recovery and significantly improved the company's overall performance. In fact, since 1992 Sears has reduced its costs by 1.4 percent (a significant sum for a \$30 billion company).

Does your company need that kind of turnaround? Daniel Gross's article "Remodeling Sears," on Page 70, chronicles Sears' IS recovery—just one of many examples of how to create business transformation by leveraging IS. As Sears has learned, the key is to integrate that critical function fully into the company's overall business strategy.



P.S. Learn how you can improve your current process for managing IT standards. A recent CIO Communications report, "Trends and Practices in Managing Information Technology Standards," surveyed IS executives in several industries from companies with annual revenues of less than \$10 million to more than \$10 billion. For more information and to order a copy, please call Diane Martin at 508 935-4274 or send e-mail to dmartin@cio.com.

PHOTO BY WEBB CHAPPELL

CIO SALES OFFICES

President and Group Publisher
JOSEPH L. LEVY
508 935-4601

Senior VP/Sales
MICHAEL J. MASTERS
201 244-5510

EAST COAST

Regional Director/Advertising Sales
FRANK S. GENOVESE
201 244-5505

District Manager/Advertising Sales
EILEEN HENKE
201 244-5507

Sales Operations Coordinator
MARLENE M. LEVIS
201 244-5519

Advertising Sales Associate
JOAN BONADEO
201 227-1140, FAX 201 227-1565

NEW ENGLAND

Regional Manager/Advertising Sales
LEN GANZ
508 935-4039

Advertising Sales Associate
CAROLYN CONNAUGHTON

Advertising Sales Associate
TIM LEONARD
508 935-4092, FAX 508 872-0618

SOUTH CENTRAL

Regional Manager/Advertising Sales
ROBERT E. SAWDON

Advertising Sales Associate
SOUNTHALY OUTHAVONG
972 239-5736, FAX 972 239-5734

NORTH CENTRAL

Regional Manager/Advertising Sales
KEITH KENNER
847 441-5005, FAX 847 441-5150

WEST COAST

Regional Director/Advertising Sales
GERALD E. PARSONS
415 693-1987

Regional Manager/Advertising Sales
RICHARD BASTAS
415 693-1988

Advertising Sales Associate
JODY J. NAGY
415 693-1993

Advertising Sales Associate
JULIA SMITH
415 398-8200, FAX 415 398-4649

LIST SERVICES

List Services Manager
STEPHANIE LEGELIS
508 935-4433

List Services Coordinator
KATHRYN A.W. GRAYSON
508 935-4072

List Services Assistant
AMY McCABE
508 935-4151
800 859-5478, FAX 508 872-8506

For further sales information,
visit our Web site at
www.cio.com/marketing/salesoffices.html.

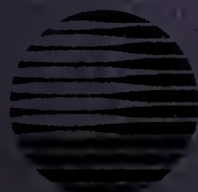
“



”

You called it.

In the annual Data Communications magazine User Survey of Long-Distance Carriers, AT&T was rated #1 in five categories: customer service, network performance, Internet access, frame relay services and switched digital service. In fact, this is the third year in a row that we've come out on top in every quality performance measure. So for business communication services you can always count on, there's only one call to make: 1-800-222-0400. Or visit www.att.com/business.

**AT&T**

Trendlines

NEWS, INSIGHT, HUMOR, REVIEWS

Edited by Alice Dragoon

Here's Looking at You, Kid

SURVEILLANCE While you've got your eye on that corner office promotion or the last Twinkie in the snack tray, someone else is keeping an eye on you. In the early '90s, 20 million Americans were subject to electronic monitoring at work through their computers, and if trends continue, almost 40 million knowledge workers might be under the watchful gaze of Big Brother by the end of the decade, says Carl Botan, associate professor of communication at Purdue University.

Most companies with networks are able to monitor e-mail logs as well as shared database and file server access; some track employees' typing speeds and warn them if they seem to be slacking off. According to a 1993 *Washington Post* article, 30 percent of top managers in large companies admitted they had searched employee computer files, voice mail or other networking communications. "If you're hooked up to a network, you can be surveilled," Botan says. "It's not that you're either surveilled or not surveilled; it's a matter

of how much."

In a survey last year of almost 500 members of the International Brotherhood of Electrical Workers in New Jersey, many of whom work in communications-intensive positions, Botan found that 70 percent of the sample thought they were under surveillance at work at least part of the time. Surveillance is often the result of downsizing when companies reduce mid-level managers, Botan says. To maintain the control those managers once exerted, companies may turn to inanimate managers: monitoring devices.

But the big news isn't that you're being watched (duh). It's that being watched at work might change the relationships between employers and their employees—as well as between workers—and that surveillance might be bad for business. Botan says surveillance can stifle workplace communica-

tion and the flow of information—two things many companies are trying to improve through knowledge management efforts.

Respondents to Botan's questionnaire said that knowing they were being watched—or that they might be watched—made them feel that they had not only less privacy but also less understanding of the workplace and lower self-esteem. They reported diminished workplace communication,



Faring Well

TRAVEL MANAGEMENT As travel expenses go up, corporations are trying to rein in costs while still sending employees where they need to go. TravelNet Voyager Phase One, corporate travel management software from TravelNet Inc. of Santa Clara, Calif., reduces costs by managing travel contracts and policy compliance; the software also automates the travel booking process.

Using Voyager, employees can make air, hotel and car reservations from their workstations. The traveler clicks on the TravelNet icon and enters basic information such as preferred travel dates, departure time and destination. The software then

integrates the traveler's request and the corporation's travel policies with available airline schedules. Within seconds, a complete report of flight availability and fare advice appears on the user's computer screen, ordered by closest match to the traveler's request and corporate travel policy. The program also answers questions like, "Will it reduce the cost if I stay over Saturday night?"

TravelNet Voyager can be used with any travel agency. It is available for Unix, Windows and Macintosh systems or can be accessed as a Web application. For more information, call 408 327-9900 or visit www.travelnet.com. ■





Choosing the wrong remote access products can be a fatal mistake. Only Ascend's leading remote access solution with inte-

If You Didn't Buy Ascend's Remote Access Products With Built-in Firewall Security, There Are Other Steps You Could Take.

grated Secure Access™ Firewall can protect your entire company. And only Ascend can do it right now. From the corporate level to the remote user to the telecommuter, advanced firewall security keeps every site

safe. Security is transparent to users and unauthorized users are completely restricted. Plus, it's all managed and configured

from one central site, and compatible with most ISPs.

Call now. The job you save may be your own. For your



free copy of "Access Denied: The Benefits of Integrated Security" Call 1-800-632-8347 ext. 403.

Remote Networking Solutions That Work.™

MAX™ Family

Leading central site WAN access switch*
Integrates Analog modems, ISDN BRI & PRI, SW56 and Frame Relay.
Scalable from 8 to 672 ports.
The only central site solution with integrated firewall.



www.ascend.com

Pipeline™ Family

Award-winning remote access solution.
Integrates Analog, ISDN BRI, SW56 and Frame Relay network services.
Includes Ascend's Dynamic IP addressing for Internet Access.
The only remote site solution with integrated firewall.

Trendlines

especially healthy grousing between employees. "Supervisors and managers might feel less need to maintain supervision," Botan says, "and the employee becomes so accountable for moment-to-moment communication on the keyboard that there's little opportunity for other communication."

If a company tells its employees it's spying on them without actually doing so—a common practice to get some of the benefits of surveillance without any investment—then the negatives might outweigh the positives. "The acknowledgment by the company that you're being [watched] is not very important, because it might not be true," Botan says. —Heath Row

Playing it Safe

SECURITY GUIDE How much does a typical breach of computer security cost? Is it worth the expense to protect your organization's systems from all security threats? Will your business insurance cover any loss or damage resulting from breaches in computer security? Answers to these and other security questions can be found in "Every Manager's Guide to Computer Security." For a free copy of the booklet, published by Loxa Corp., an Oklahoma City-based computer security consulting firm, call 800 505-5692. ■

"I DON'T KNOW if the network of tomorrow will be fiber to the bedside table, cable modem hung on the cable network or the new LMDS technology. It may be all of the above. But I know this: Starbucks is successful because its coffee is lawful, socially acceptable and completely addictive. Bandwidth is just like that. You can never get enough."

—Reed Hundt, chairman, FCC

No-Stop Shopping

STOCKING STUFFERS Right around now, you should be starting the stressful search for perfect holiday gifts for friends, family and the occasional co-worker. This season, save yourself and them a headache by opting for uplifting gift items that soothe the spirit and don't require jockeying for mall parking. We offer these suggestions from our own wish list:

You can't buy that mopey friend on your list a positive mental attitude, but you can order the next best thing: Brain Stickers. These clear vinyl strips with faux etched-glass letters cling to windows, mirrors or computer screens, where they blend into the scenery while their messages remind the subconscious to keep its chin up. Potentially life-altering slogans like "I am relaxed and calm," "I am intelligent" and "I putt with confidence" are a rare bargain at less than \$4 a pop. (A note of caution: If you choose to stuff someone's stocking with one of these, be diplomatic in your presentation.) For more information, visit www.affirmation.com.

History buffs or fans of famous quotations certainly will appreciate a Remarkable Moments talking frame. Billed as the "future of collectibles," these nifty frames, available in wall or desktop versions, combine pictures of great moments in sports, entertainment and history with 20-second sound bites from the actual events. Cheer at the finish line of the closest race ever in the Indy 500. Hear Rhett not give a damn while watching him hold Scarlett in his arms. Stare earnestly at John F. Kennedy as he urges you to ask what you can do for your country. To check out the full range of Remarkable Moments, call 714 366-2800 or visit www.moments.com.

Jane Fonda it's not, but a workout regimen from Deskercise International Inc. will help your fitness-conscious colleagues go for the burn without breaking a sweat—or leaving their desks. The program periodically pops up on the computer screen, and a "personal trainer" clad in business attire leads 30- to 45-second exercises such as military presses and gluteal kickbacks. The 17 different drills are said to decrease carpal tunnel pain and increase the heart rate without causing perspiration. Just \$49.95 buys Deskercise software and a stretchy resistance band with handles at either end. Executives who admire the Chinese workplace ritual of mass exercise could give programs to their employees (discounts for bulk orders!) and set them all to come on at the same time. Visit www.deskercise.com for ordering information or to see pictures of the trainers.

And finally, for that colleague who complains of being distracted by office noise—the bumps and grinds of the hard drive, the inane conversation in an adjacent cube—offer to foot the \$20 registration fee for downloading Wind Chimes 1.01. The shareware for Windows 95 and Windows NT simulates the sounds of tinkling wind chimes, a soulful guitar melody or gentle ocean waves. Should the ambient noise become too soporific, users may tune in to raging storms or a rousing gunfight at the OK Corral. Visit www.syntrillium.com to register.

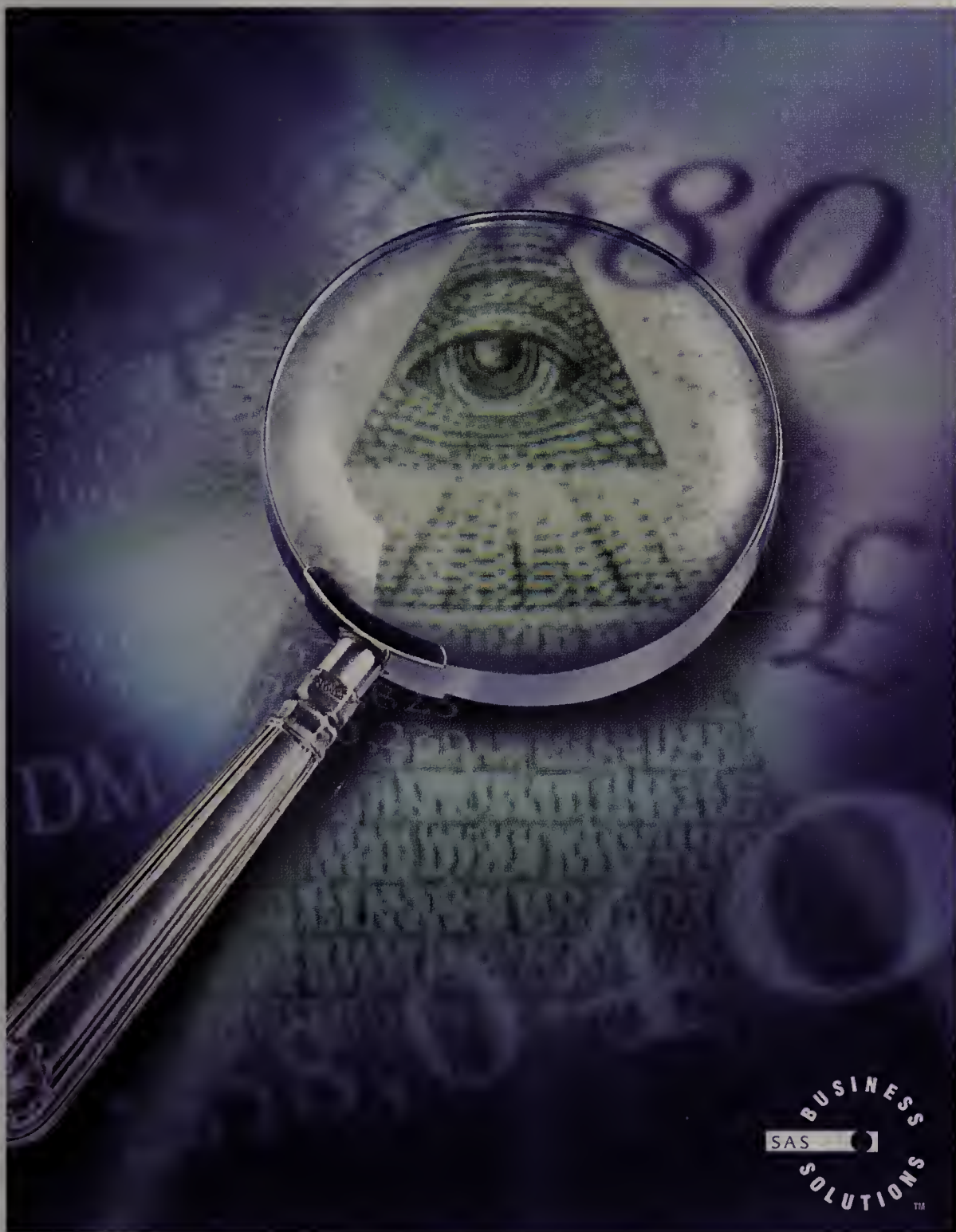
—Sara Shay

DECISIONS ARE TOUGHER.
TIME IS **CRITICAL**.
RESOURCES ARE LEANER.
AND THE BUCK STOPS WITH **YOU**.
...HYPE JUST WON'T CUT IT ANYMORE.

Introducing

CFO Vision™

**THE POWER TO
FIGURE IT OUT.**



Stop crunching and start analyzing. With CFO Vision you can visualize your business interactively...and gain control of information to spot opportunities and risks faster than ever before. Reengineer the entire process of *financial consolidation, reporting, and analysis*...as you accelerate the flow of information to decision makers at every level of your organization.

With the click of a mouse:

- Understand the facts beyond the figures.
- Improve timeliness and availability of business reporting.
- Analyze every "slice" of your business—from branch profitability to product cost analysis—in any currency.

Powerful, award-winning data warehousing, OLAP, graphics, and EIS capabilities are all included in one fully integrated, easy-to-use solution. It's all yours from one vendor: SAS Institute, with a proven track record for continuous innovation and reliable support at more than 29,000 organizations worldwide...including the *Fortune 100*.

For a free preview of CFO Vision, just give us a call or send us E-mail at cio@sas.sas.com



919.677.8200 Fax 919.677.4444 In Canada 1.800.363.8397 www.sas.com/vision/



SAS is a registered trademark, and CFO Vision a trademark, of SAS Institute Inc. Copyright © 1996 by SAS Institute Inc.

COMPAQ
PROLIANT

①

IT'S AN INTERNET
IT'S A FILE AND PRINT



© 1996 Compaq Computer Corporation. All rights reserved. Compaq and ProLiant registered U.S. Patent and Trademark Office. The Intel Inside Logo and Pentium are registered trademarks and the Pentium Processor Logo and the Pentium Pro Processor Logo are trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. In Canada, we can be reached at 1-800-567-1616.

The most predictable thing about business is that it's unpredictable. Your needs are likely to be different from one day to the next (or for that matter, from one department to another). You either need a range of servers to accommodate all your different needs. Or one affordable server with a very wide range.

Introducing the new Compaq ProLiant 2500. Simply put, it's the most versatile platform available today. Its modular chassis lets you easily swap components to meet any new set of requirements. So you only need to purchase for your needs today. And as your

SERVER. IT'S AN APPLICATION SERVER.
SERVER. CAN AN IDENTITY CRISIS BE A VIRTUE?

business grows, the Compaq ProLiant 2500 provides the scalability to go from file and print to Internet or application server. While

d i s t r i b u t e d



a c c e s s

giving you the availability and management

features you need to run your mission-critical

applications. And with Distributed Access, the

information you need will always be close at hand.

In other words, it's the first platform that's versatile and flexible enough to run your business on—today and tomorrow.

To find out more about the ProLiant 2500 or Distributed Access, visit us at www.compaq.com/us, or call 1-800-319-7778 to locate the Compaq reseller near you.

COMPAQ

Has It Changed Your Life Yet?

Trendlines

Digit-al Security

USER AUTHENTICATION Your seventh-grade typing teacher always told you that using the correct keystroking patterns would help you in the long run. Whether you still heed that advice or peck at the keyboard with two fingers, your individual typing style may one day prevent someone else from using your computer.

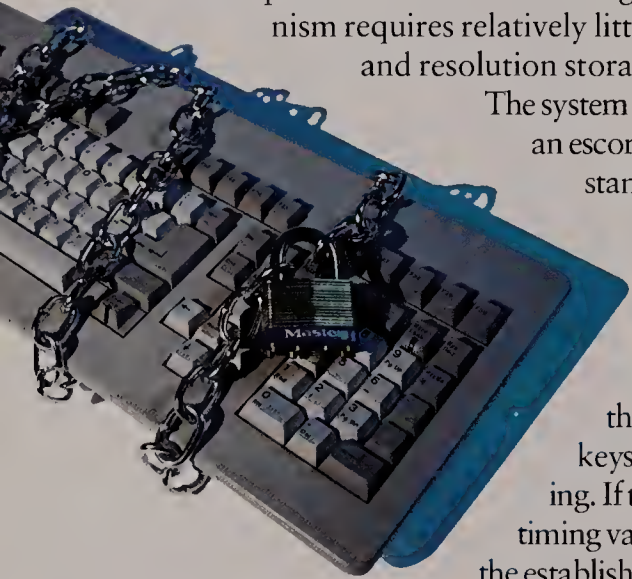
A research team led by New Mexico State University Professor Juris Reinfelds has developed a method of identifying typing rhythms to guard against unauthorized access to computer information. Their system, which is not yet available commercially, recognizes when a different person is at the keyboard by analyzing the keystroke timing patterns.

"People type in a unique way, and their typing style remains relatively constant over time," says Reinfelds, who has worked on user authentication since 1987. "We have this measurement—the time intervals between successive key pushes—available to us at a very low cost." Measuring keystroke timing can cost significantly less than using security systems that check fingerprints or verify voice patterns because the timing mechanism requires relatively little data and resolution storage.

The system acts like an escort, constantly following users by measuring their keystroke timing. If the user's timing varies from the established pattern, the computer can

ask the user to type a few lines of text as a test or activate an alarm and deny further access.

Reinfelds and his team have been refining the system to maximize recognition with the smallest number of keystrokes. They can now recognize distinct patterns within 300 keystrokes with a low failure rate and few false alarms. The next step in the research, says Reinfelds, will be to determine a network's effect on the process of timing keystrokes. ■



Off the Shelf

Future Visions

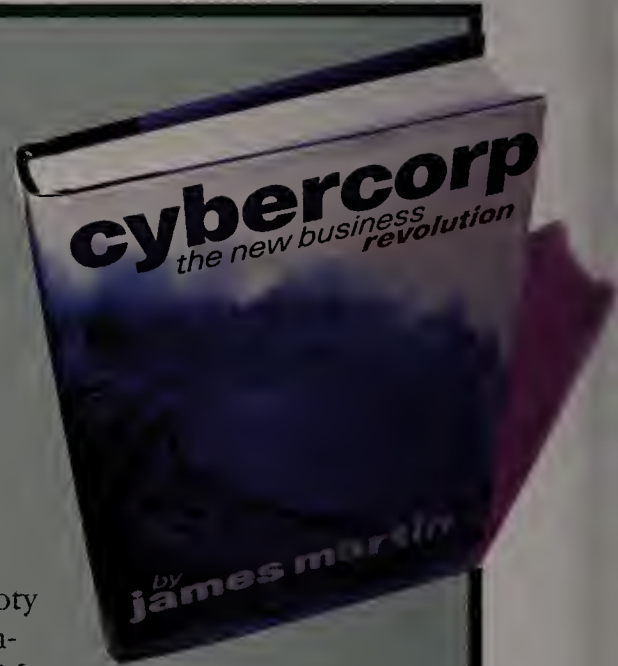
Cybercorp: The New Business Revolution James Martin, Amacom, 1996, \$27.95

YOU WOULD HAVE every right to expect a book entitled *Cybercorp* to read like a futuristic cyberpunk romance in which doomed twenty-somethings endure constant sooty rain and eat a lot of noodles. Well, abandon those expectations. Author James Martin is a professional business visionary, the kind too many loosely call a "guru." Unfortunately, this time out, his predictions have the prescience of fortune cookies.

Here's a sample of the news: "One of the key characteristics of the cybercorp is that things happen fast." That less-than-novel observation leads to breathless citations of companies that resolve customer queries even while people are on the telephone. (Remember, the book purports to describe the future.) And here's the advice you've been thirsting for: "The cybercorp should be designed to be a learning-efficient organization. It should use networks and computers to capture, enhance, store and disseminate knowledge from both internal and external sources." Anyone who has scanned *CIO* or any other business magazine may be tempted to say, "Gee whiz, really?" Incidentally, if you want particulars on how to use computers and networks to become a learning organization, you'll have to buy another book.

No technology or management theory buzzword from the past decade escapes *Cybercorp*, and so in a perverse way it might be possible to make a case for the book as a broad overview of...a lot. Still, it is difficult to imagine that there can be any CIOs or CEOs at enterprises larger than Mom & Pop's Corner Sundries who don't already know most of what Martin is trying to peddle as news. If they don't, why do they draw salary? The ideas in *Cybercorp* may be repackaged, relabeled and rewrapped, but that doesn't disguise the fact that the book is just another can of the same stale old beans.

—Perry Glasser



"MOST PEOPLE DON'T REALIZE THAT CLIENT/SERVER IS DEAD.

There's a greater and greater disaggregation of the components that make up the computing environment. You're going to have to have an environment where you can plug and play—the network will contain the elements to build what you need at the moment, then [the application] will be disbanded."

—Kim Sienkiewicz, manager of technology assessment and evaluation, John Deere Credit Inc.

Create.
Integrate.
Communicate.



Scott Barnes, MCI
Senior Manager of Database Marketing Systems

To reach thousands of new customers, MCI® began with one call. To Sybase®.

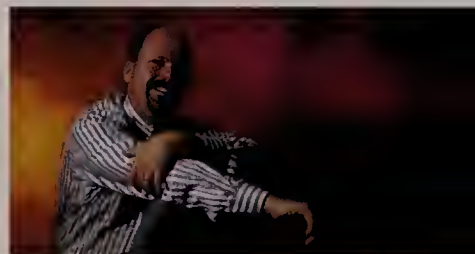
Sybase IQ™

How do you gain a competitive advantage? By being first to market with products and services customers want. Ask MCI,

whose ability to satisfy customers is turning the tables in telecom marketing. Thanks to Sybase IQ, MCI's Small Business Unit rapidly implemented a

distributed datamart to transform mountains of available data into targeted market segment campaigns. As a result, MCI

launches their campaigns into the market with lightning speed while their competitors are still retrieving data. "Sybase IQ's



phenomenally quick response time lets us implement new ideas in days instead of weeks," says Scott Barnes,

"with precision and flexibility we'd never come close to before." Speed and agility are merely part of the edge



Sybase offers businesses today. To take the first step in exploring the possibilities,

visit www.sybase.com/mci. Or dial 1-800-8-SYBASE. That's how it all begins.

 **SYBASE®**
www.sybase.com

Trendlines

Keeping Watch

ABUSE PREVENTION

When the father of a 10-year-old Washington County, Pa., girl was released from prison after serving time for sexually molesting her, the girl and her mother feared he would begin harassing them. Then a local child protection agency gave the girl an electronic pendant that would alert authorities when she pressed it. The father stayed away.

Through the efforts of Watchful Shepherd USA, children like that 10-year-old girl who risk being abused have a way to call for help when they feel threatened at home.

"Adults have 911; the elderly and homebound have emergency response units," says Watchful Shepherd founder Joseph Femiani, a Pittsburgh entrepreneur who is himself a survivor of child abuse. "I thought children needed the Watchful Shepherd."

Designed by Market Central Inc., a Houston, Pa.-based maker of specialty computer accessories, the transmitters, which are worn in a pendant or wristband, wirelessly communicate with an answering-machine-size unit in the child's home that is connected to a phone line. When a child presses the pendant, the unit alerts a local hospital, where information about his or her case automatically shows up on a computer screen. The hospital staff immediately calls the child at home and notifies the police.

The unit regularly performs random self-tests and automatically warns the hospital if the power or phone connections are impaired. Installation is either court-mandated or based on the recommendation of a youth services agency.

Market Central sells the units to area hospitals for \$350. With money earned through fund-raising activities, Watchful Shepherd chapters and hospitals provide the pendants free of charge to designated families. Since 1993, children in 82 families in Pennsylvania have been equipped with the transmitters; police were called to their homes 51 times and in 12 cases took protective custody of one or more children. This year, new groups of Watchful Shepherds are forming in Indiana, Massachusetts, New Jersey, Virginia and Australia.

—Sara Shay

Career Moves

Glen White has been appointed CIO at Excel Communications Inc., the nation's fourth-largest provider of residential long-distance services. White was formerly senior vice president of IS at Gulf Insurance Cos.

Ken DeWitt has been promoted to the new post of vice president of credit information systems for Sears, Roebuck and Co.'s IS group. DeWitt, who joined Sears in 1994 as senior systems director, oversees IT strategy and communications systems related to the company's credit business.

Intelligent Electronics Inc. has named **Lionel Brown** CIO of its Reseller Network Division.



Leadership

Who's On Board?

Percent of members of U.S. companies' boards of directors who are women

10

Percent of companies that have no women on their boards

29

Percent of companies that have at least one male director

100

Percent of board members who are African-American

4

Percent of board members who are Hispanic or Asian

2

Percent of board members who are Caucasian

94

Percent of board members who are at least 56 years old

67

Percent of board members 45 years old or younger

6

Source: Coopers & Lybrand LLP's "Board of Directors' Compensation: 1996" survey of 301 U.S. companies.

John A. Zarb has joined Libbey Inc., a designer, manufacturer and marketer of glass and tableware products, as vice president and CIO. Previously he was CIO of AlliedSignal Inc.'s worldwide Automotive Aftermarket Division.

Thomas T. Schwaninger has joined Aetna International Inc. as vice president and CIO. He is responsible for the delivery of technology services to support the integration of marketing, product development, customer service and production as Aetna International expands its product lines and enters new countries. ■

Get the competitive edge!

YES, please enter my one-year subscription (21 issues) to CIO magazine and bill me later for only \$75, a savings of \$23 off the basic rate!

Name _____

Title _____

Company Name _____

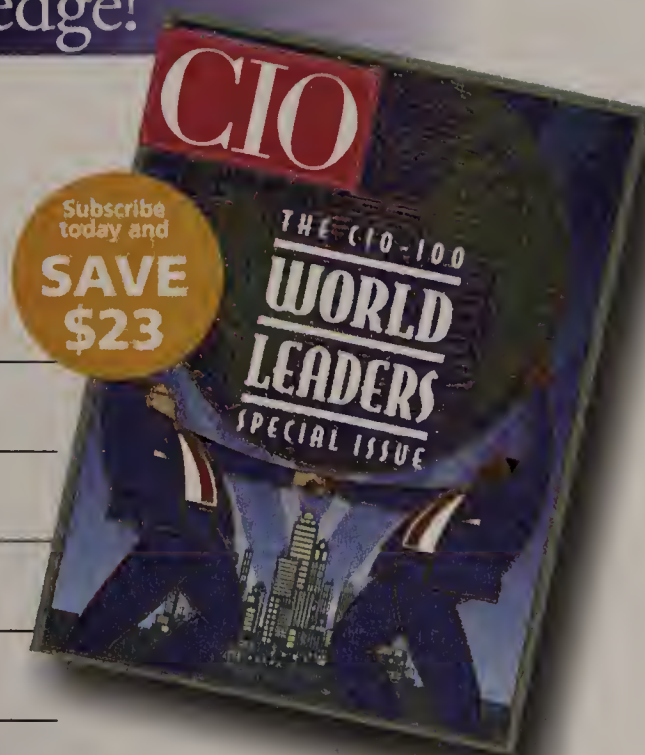
Address _____

City _____

State _____

Zip _____

The basic one-year subscription rate for CIO magazine is \$98. This is a domestic rate only (US and Canada.) The foreign rate is \$110 prepaid in U.S. currency.



INFA7

**New Order --
Process Immediately!**



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO.1020 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE



ATTN: CIRCULATION DEPARTMENT
PO BOX 9208
FRAMINGHAM, MA 01701-9486





If opportunity hung around
waiting for you
after it knocked,
any database server
would do.

**Digital 64-bit technology and Informix.
The competitive edge.**

Face it: speed matters. And together
Digital and Informix can deliver it to your company —
in the form of blindingly fast OLTP, data warehousing and other
key applications. With Dynamic Scalable Architecture™ from

INFORMIX® digital™ Informix and Digital's Very Large Memory,
you'll manage and manipulate data in ways
never before possible. But don't wait around — find out more by calling

1-800-688-IFMX, ext. 63 or 1-800-DIGITAL, press 4, today.

www.informix.com www.digital.com



*Companies who have
selected Open Market to
help them lead the way in
Internet Commerce:*

Bank One



**First Union
National Bank**



**Time Warner's
Pathfinder**



Tribune Company



WHY IS OPEN MARKET THE ONLY COMPANY THAT HAS REMOVED THE OBSTACLES FROM INTERNET COMMERCE? OUR GOAL FROM DAY ONE WAS TO DEVELOP COMMERCE SOFTWARE FOR THE INTERNET. AND UNLIKE OTHER COMPANIES, OUR SOFTWARE IS AVAILABLE TODAY. IN FACT, SOME OF THE WORLD'S MOST SUCCESSFUL COMPANIES ARE ALREADY USING OUR SECURE, SCALABLE

INTERNET COMMERCE SOLUTIONS TO DO BUSINESS WITH OTHER COMPANIES AND CONSUMERS. WITH THESE SOLUTIONS, LARGER COMPANIES CAN MANAGE NOT ONLY PAYMENT PROCESSING BUT EVERY ASPECT OF INTERNET BUSINESS TRANSACTIONS. AND SMALLER COMPANIES CAN REAP THE BENEFITS OF INTERNET COMMERCE WHILE OUTSOURCING THE COMPLEXITY, ALLOWING THEM TO FOCUS ON WHAT THEY DO BEST. IN SHORT, OPEN MARKET FITS YOUR NEEDS NO MATTER WHAT SIZE YOU ARE.

TO FIND THE FAST TRACK TO YOUR OWN INTERNET COMMERCE SOLUTION, VISIT OUR WEBSITE AT WWW.OPENMARKET.COM/HURDLES OR CALL 1-888-OPEN-MKT.

Open Market
245 First Street
Cambridge, MA 02142

WHAT WE'VE DONE TO IT.



We **ARE** Internet Commerce.

Money Mastery

Building dollar resources is a key skill for high-performance CIOs

BY RUSS MANEY and JULIE HORKAN MERINGER

CIOs WHO DEMONSTRATE WHAT Forrester Research Inc. calls “money mastery” match IS resources to ever-changing demands by making fixed costs variable, acquire additional funds for worthy IT projects by broadening funding sources and focus on real business value as the justification for sharing the burden of IS expenditures.

Make fixed costs Variable

A big chunk of any CIO's budget is people costs. If those costs are only salaries for internal programmers and other IS employees, they are largely fixed; however, successful CIOs control those costs by making them as variable as possible, matching them closely to changing demands by using outside help to provide resource flexibility and reorganizing internally to mimic a vendor environment.

An outside vendor can maintain legacy systems or augment employees' existing skills to help make fixed IS costs variable. Many companies staff up for a specific project by outsourcing temporarily. Others go further, permanently outsourcing all or most of their developers. Agway Inc., for example, a commercial farming supply chain headquartered in Syracuse, N.Y., outsources all of its developers to minimize overhead. Under this system, each Agway business unit's IS manager is responsible for working with the outsourcer to procure the necessary resources to get IT projects done.

Another increasingly common practice is to outsource the operations and maintenance of core legacy systems to a vendor partner (see “The Technology/Outsourcing Cycle,” Page 36). Some companies, such as R.R. Donnelley & Sons Co., a commercial printer based in Chicago, require the vendor to hire the company's former employees who had been responsible for these systems, ensuring that the vendor has employees with the proper skills and former employees have jobs.

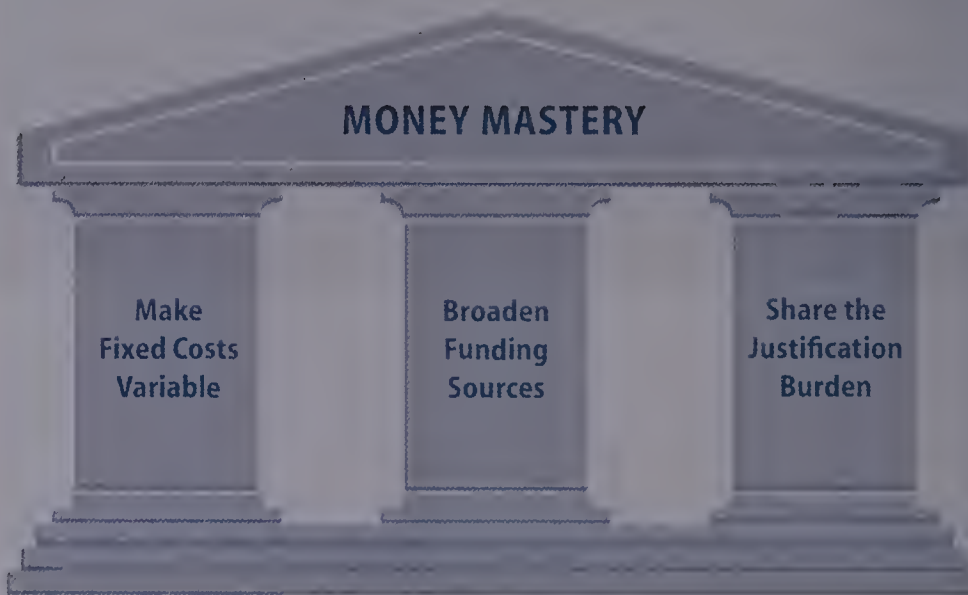
Companies also manage fixed IT costs by organizing them internally so that divisions and departments feel the pressures of a competitive market. Money-mastering CIOs create inter-

nal IS service providers that act as vendors to internal IT users. At Texas Instruments, IS resources are organized into “Centers of Excellence” that provide TI businesses with service-level agreements that detail what the businesses want to accomplish while considering how much they can afford to pay. Some CIOs take that idea further by having those groups compete with external vendors for the company's business. At the far end of the spectrum are companies that create legally separate IS organizations with their own P&Ls. Shell Services Co., for example, a Shell spinoff sells IS services to other Shell companies and to the external marketplace.

Whatever the degree of separation between the IS service groups and the rest of the company, money-master CIOs managing internal IS service providers must do two things. First, they must set cost goals to equal the best available third-party price. CIOs should get costs for providing a particular IT service down to market level within six months or rethink whether they need that capability in-house. The only internal capabilities that should

The Pillars of Money Mastery

When it comes to money, CIOs need all 3 strategies to hold up the roof



SOURCE: FORRESTER RESEARCH INC.

Because the heat is always on.

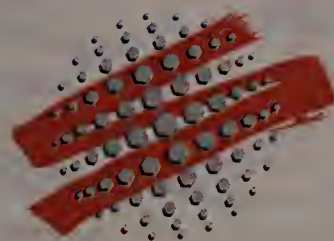
CommVault Systems offers total network storage management solutions for virtually any environment.



Today's businesses generate data at a feverish pace. Data that requires effective storage and protection. That's why at CommVault Systems, we've developed a fully integrated line of network storage management solutions that offers optimum flexibility in the most demanding environments. Our total solutions can accommodate more server platforms and more software environments than any other storage system – from automated backup and retrieval to near and on line archiving and hierarchical storage management.

In addition, we support every solution we deliver, with a single-point-of-contact who is well versed in your system. And, our Professional Services division offers the insightful consultation needed to plan, install, manage, and help your system grow.

CommVault Systems. Your best protection from getting burned.



CommVault Systems

Phone: 1-800-331-6207 • Fax: 908-935-8040

Web Site: <http://www.commvault.com>

Email: info@commvault.com

UNIX • Banyan • Windows NT • VMS • OS/2 • Lotus Notes

Forrester View

be offered at above-market prices are those deemed strategically necessary for the company's "national security." For example, an investment bank might need to retain development capabilities for its mission-critical bond-trading system rather than rely on external providers. Second, they must dismantle any internal capability that delivers noncompetitive, nonstrategic IT services. If a nonstrategic service such as PC support is

overhead. Many companies are dealing with the cost of solving the year 2000 problem this way. In essence, the CEO is IS's venture capital source, funding special projects critical to the company's future or unproven but promising technologies that the business units aren't ready to fund themselves.

Many creative CIOs convince vendors or customers to share the costs of critical projects in exchange for some of

ple, Fruit of the Loom's IS department built a Web site template to give to its activewear product line distributors. Because the template kept the company name in front of its distributors' eyes, the CIO pitched the \$2 million template to the board as an advertising campaign, not an IS project.

Share the Justification Burden

To justify the costs of IT projects to senior management, shrewd CIOs use these three approaches:

■ Business Unit Responsibility

Having business unit managers, not IS, be responsible for presenting IT project requests to senior management is standard operating procedure in some companies. At L.L. Bean, for example, the business units put together the business cases for IT project requests. If the business units can justify a project, IS won't say no. IS is responsible for helping the business units understand the costs and ramifications of their request on other IT projects and the company as a whole.

■ Behavior-Driving Budget Rules

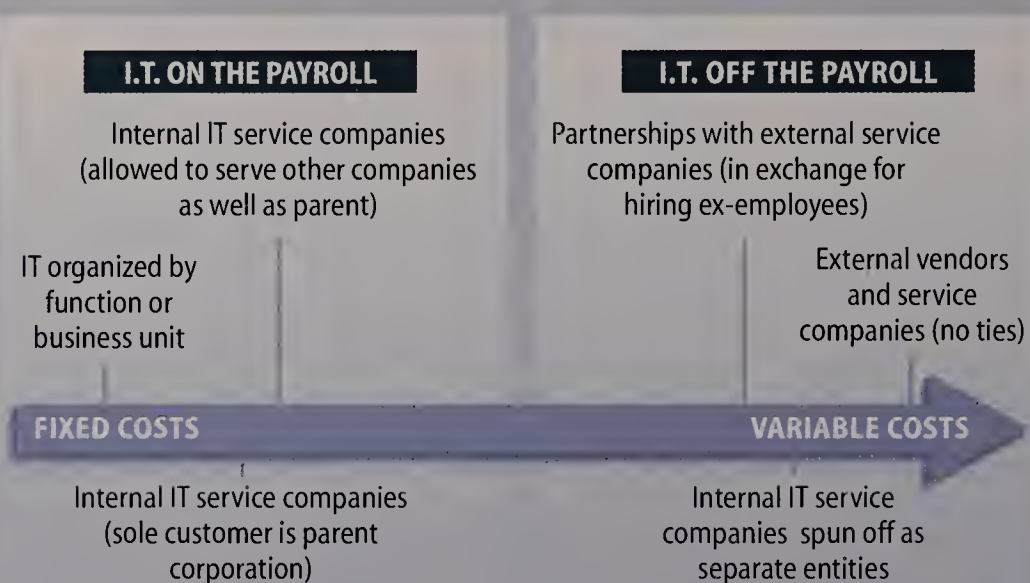
Some companies set up their budget guidelines or processes to drive specific behavior on the part of the business units. At Fruit of the Loom, management encourages self-policing behavior with an "express checkout lane": Any IT project that requires fewer than four person-weeks of effort receives less stringent review. As a result, business units scrutinize their requests and rip out the "nice to haves" to reduce the project so that it meets the easy-approval criteria. At Thiokol, the IS group holds a day-long off-site meeting where the business units prioritize IT spending based on their needs. One objective of requiring that significant time commitment is to help users understand what their money is buying. The process reinforces that users have the ability and responsibility to help IS manage costs.

■ Identifying "Money is no Object" Needs

Of course, the easiest projects to justify are those that serve the people who pay the bills: customers. Any management team should be willing to spend whatever it takes to correct a serious customer service problem. At computer parts supplier Amdahl Corp., in Sunnyvale, Calif., managers say "a customer service problem is an Amdahl problem." The com-

The Range Of Alternatives

As IT moves off the payroll, IT units become more independent and costs become more variable



SOURCE: FORRESTER RESEARCH INC.

cheaper to buy externally, then CIOs should stop providing it internally.

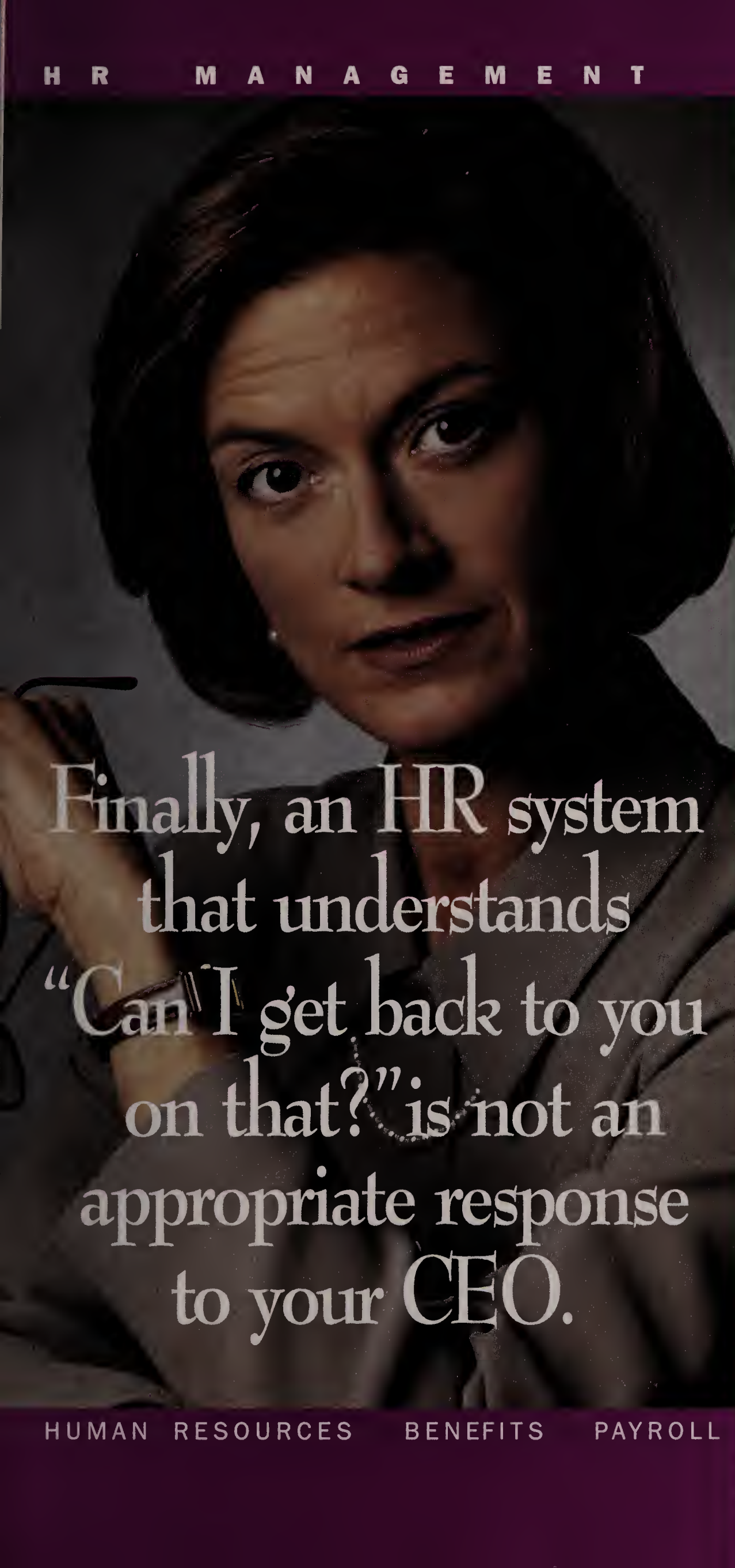
Broaden Funding Sources

While they're careful custodians of the funds they have, high-performing CIOs are also skilled at reaching beyond IS to find additional dollars. That way the "approved" IS budget no longer limits business-driven technology solutions, and mutually beneficial relationships are created with business counterparts and external partners. A CIO's top three targets to fund critical projects are the CEO's checkbook, external partners and other departments' budgets.

CIOs often lack the funds in their own budgets for needed infrastructure investments but don't want to waste time fighting with business units that are reluctant to help pay for them. So high-performing CIOs go straight to the CEO to convince him or her that these projects should be part of general corporate

the benefits. Short on cash, the American Red Cross, based in Falls Church, Va., talked an Internet service provider, HLC Internet Inc. of Irvine, Calif., into putting up the money to build an external Web site and intranet for the nonprofit organization. In return, HLC was promised monthly fees from the Red Cross' 1,600 chapters worldwide and 200 armed-forces emergency services units. Another example of cost sharing occurred at Thiokol Corp. When the aerospace and industrial technology company based in Ogden, Utah, could not afford to revamp its inventory management systems, it persuaded its biggest customer—NASA—to help. Thiokol reasoned out that the more sophisticated its inventory system, the faster NASA would receive parts for the next shuttle launch.

CIOs can also look to their company's business units or function managers to pay for projects that will specifically benefit those units and functions. For exam-



Finally, an HR system
that understands
“Can I get back to you
on that?” is not an
appropriate response
to your CEO.

You know the feeling. Your boss appears in the doorway, asking for information that your current HR software just can't produce on demand.

Fortunately, with a Human Resource Management System from ADP, everything from benefits projections to staffing analyses is just moments away. Because our systems are so flexible, they allow you to access the information you want, the way you want it.

And with over 20 years of HR experience, ADP will be there to guide you every step of the way. From current system analysis to new system implementation to ongoing maintenance, we'll provide a support team dedicated to your needs.

No wonder over 5,000 companies rely on ADP for HR solutions. Whether your company is LAN- or WAN-based, requires single-user or client-server platforms, we provide solutions that seamlessly integrate your HR, benefits and payroll information.

So the next time your CEO asks for information, you'll be able to deliver it on the spot. To find out more, visit us at adp.com or call for a free demo disk.

1 800 CALL ADP
ext. 388

www.adp.com

Forrester View

pany recently spent \$6 million on customer support and decreased response time to customer service requests from 21 hours to less than two hours. Customer service and support puts \$250 million in profit on its bottom line, so that \$6 million was hardly an unreasonable expenditure.

Paying lip service to the idea that IS must focus on business value is about as controversial as coming out in favor of motherhood and apple pie. The biggest difference between the most successful CIOs and others is their passion for linking IT to business value. They're fanatics about seemingly minor details, like the language used to discuss IS and IT projects. They habitually publicize technology victories to the rest of the company, the outside world and their own IS organizations with near-evangelical zeal. More important, they never miss an opportunity to drive home the point that business value is what matters. "My people are used to thinking of themselves as developers and operators," says Bob Paquin, CIO at L.L. Bean. "I want them to think of themselves as systems integrators and consultants. Being world-renowned for our development skills is not our goal. Our goal is to help L.L. Bean be world-renowned for high-quality products and great customer service." And at Textron Inc., a multi-industry company based in Providence, R.I., IS management speaks of its recent infrastructure revitalization project as "changing the way the company does business, using IT as a key enabler" instead of as "a technology replacement project"—although it certainly was that, too.

Winning CIOs talk that way because they know that when they do, the money they need to supply top-quality enterprisewide service will flow to them. There's no doubt that a huge part of creating a high-performance IS organization is mastering money. **CIO**

Russ Maney is director of leadership strategies at Forrester Research Inc. in Cambridge, Mass. Julie Horkan Meringer is an analyst for leadership strategies at Forrester. They can be reached via e-mail at rmaney@forrester.com and jmeringer@forrester.com respectively, or at 617 497-7090.

The Progress of Technology Sourcing

Very new and very old technologies are best performed outside the enterprise

Phase One: Early outsourcing

To deploy new systems more quickly and acquire skills, internal IS groups harness the expertise of outside specialists because early outsourcers master advanced technologies faster than large corporate users.

Phase Two: Internalization

Once new systems demonstrate their worth, re-skilled, internal IS groups with superior knowledge of the business take over from early outsourcers in one or more business units to customize and expand the new systems.

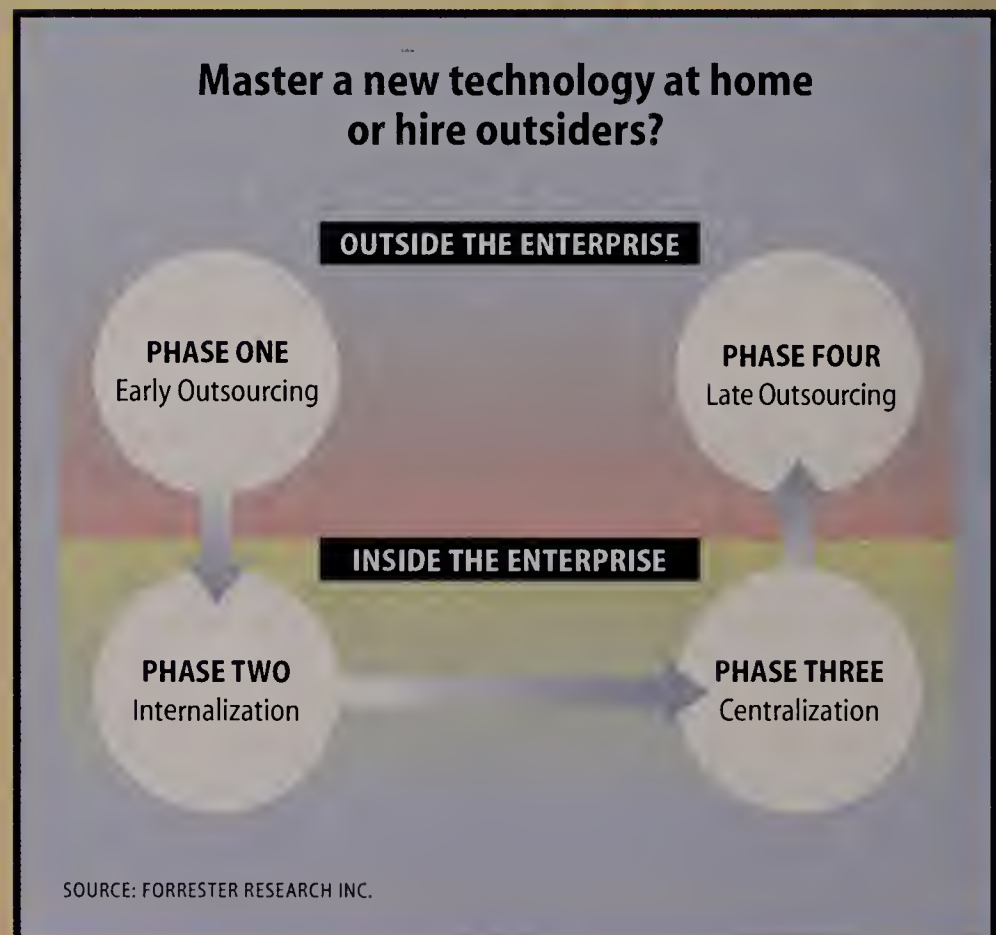
Phase Three: Centralization

As a technology spreads and matures, responsibility for enterprisewide support and limiting purchasing expense flare-ups shifts to the uniquely positioned central IS group.

Phase Four: Late outsourcing

Legacy applications that no longer yield any competitive benefit and distract from new technologies are contracted to late or legacy-systems outsourcers who generate economies of scale beyond the capability of the company.

—R. Maney and J. Horkan Meringer



FOR YEARS,
PEOPLE HAVE BEEN
TELLING YOU
TO *unplug*
THE MAINFRAME.

Netscape - [Protector Insurance Company]
File Edit View Go Bookmarks Options Directory Window Help
Location: http://www.xprotector.fr



Protector Insurance Company

Que vous souhaitiez assurer votre entreprise ou votre domicile, Protector Insurance vous offre la couverture dont vous avez besoin. Depuis 1956, nous sommes l'un des leaders de l'assurance immobilière destinée aux particuliers. Nous pouvons également

Division Parisienne

Netscape - [Telephonix]
File Edit View Go Bookmarks Options Directory Window Help
Location: http://www.xtelephonix.de/ollenburg

Telephonix International PHONE CARD

TELEPHONE ACCOUNT

1	2
4	5
7	8
*	0
Payment	Help

#	CHARGE PER CALL
16	10.6
71	20.4
17	9.5

Netscape - [Amorelli Crank Works]
File Edit View Go Bookmarks Options Directory Window Help
Location: http://www.xcrankworks.it

Questa pagina è disponibile in **ITALIANO** or **ENGLISH**



NEW FROM AMORELLI

These 6330 road bike cranks are polished to a mirror finish and reinforced with 7075-T6 aluminum design for only 575 g. with rings. 130 mm ball bearings 1/8" 172.5



NO 612



NO 415

Amorelli Crank Works

To our customers: The mission of Amorelli Crank Works is to bring to both the manufacturer of specialized dedicated cyclist the best in cranksets. We use high quality materials, including 7075-T6 aluminum and offer over 12 different kinds of cranksets to fit every need. Our workmanship is also legendary, which is why we offer a lifetime guarantee. If you require further information, please contact us.

COST

MAN. TIME

SHIP DATE

With S/390, you can tell

It's a new world out there. The rich corporate data and critical applications on your System/390® can be easily expanded into exciting new business opportunities via the Internet. So now you can safely make information instantly available to customers. S/390® has the outstanding capability of handling thousands of inquiries, allowing customers to connect with you all day, every day. And, when used on an

IBM, System/390 and S/390 are registered trademarks and OS/390 and Solutions for a small planet are trademarks of International Business Machines Corporation. Netscape Communications, the Netscape Communications logo, Netscape and Netscape Navigator are trademarks of Netscape Communications Corporation.

Netscape - [Mercy Hospital]
File Edit View Go Bookmarks Options Directory Window Help
Location: http://www.xmercy.br/records

HOSPITAL MERCY

Endereço

Nº do arquivo

Raio X

Tipo sanguíneo

Alergias

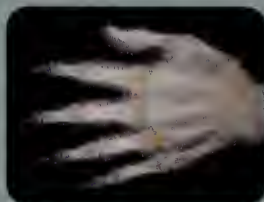
Histórico

Informações

FICHA DO PACIENTE

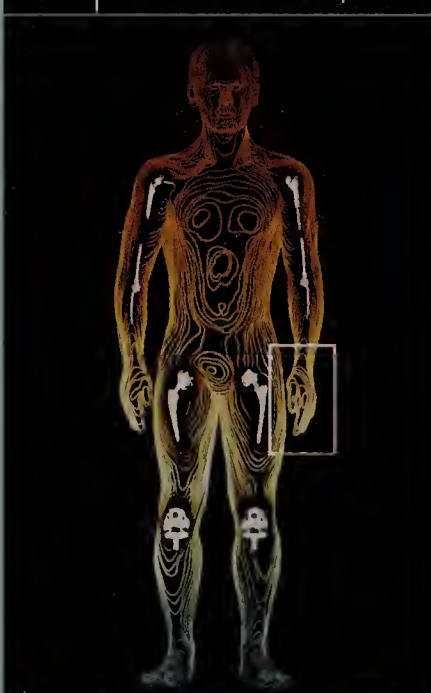
Carlos Prospero

Carlos Prospero deu entrada na emergência às 19:00 horas no dia 28/11/91. Foi vítima de um acidente de carro aproximadamente às 18:30 horas. Atendido pelo Dr. Bandeira. A sua mão esquerda ficou presa na porta do carro, que abriu e fechou durante o acidente. Ao ser internado, tinha dores e sangramento na mão esquerda. Havia suspeita da existência de várias fraturas e foram solicitados Raios X.



As radiografias revelaram fraturas nos 1º e 3º dedos da mão esquerda.

#00901 Carlos Prospero



Nº do paciente 6177

28-11-91

Track 34

Get Down and With It Vol.

Track 35

Colossal Arm

Do We Really Want To Do It?

Track 36

PLAY

VOLUME

FIND CLASSICAL

S*und

25hz 50hz 100hz 250hz

ACCOUNT INFORMATION

Account Holder: Stephanie Ollenburg
Account #: 417 212 260 7548
Billing Date: 210496

Hello, Ms. Ollenburg! Since you have been a valued telephone customer for the last 10 years, we'd like to tell you about our new "Weekend Savings Plan" discounts on International calls. You'll get 25% off on calls to western Europe and the UK. In addition, you'd like information on our new telephone service, just click on "Special Offers".

	TIME	AM
Illinois	10	\$
New York	25	\$3
Germany	31	\$1

Netscape - [Tokyo Investment Corporation]

File Edit View Go Bookmarks Options Directory Window Help

Location: http://www.xtokyoinvest.jp/world



Welcome to the Tokyo Investment Corporation (TIC) Web site. Our goal is to provide you with the split-second changes happening in stock markets around the world, as well as information on the world's leading companies. We hope that TIC can be of service to you.

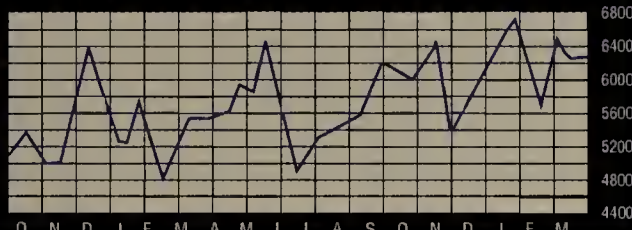
このページは日本語でご覧になれます。



ENGLISH

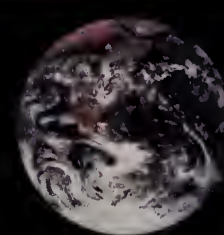


World Stock Index



Region/ Country	DJ Equity Market Index, Local Currency	Pct. Chg.	Closing Index	Chg	Pct. Chg.	12-Mo High	12-Mo Low	12-Mo Chg	Pct. Chg.	from 12/31
Americas			148.99	+ 1.25	+ 251.321	149.98	526.32	+ 0.85	+ 1.25	+ 0.85
Canada	133.73	- 0.16	158.87	- 0.051	- 742.951	158.87	133.73	- 0.16	- 0.051	- 0.16
Mexico	224.98	+ 3.44	92.29	+ 8.631	+ 126.351	92.29	224.98	+ 3.44	+ 8.631	+ 3.44
U.S.	601.98	+ 0.96	601.86	+ 3.251	+ 325.361	601.86	601.98	+ 0.96	+ 3.251	+ 0.96

Germany	12%	USA	20%
Africa	10%	Japan	40%
		Australia	18%



World Stock Market Performance



For more information on individual stock markets, please click on the appropriate flag.

them to *plug in* instead.

intranet, the S/390 Web site offers a whole new way for your employees to get access to the data they need. To get more information about using S/390 as a Web server, and to find out about our no-charge OS/390™ Internet BonusPak software offering, visit our home page at www.s390.ibm.com or call 1 800 IBM-2468, ext. CA250. Solutions for a small planet™



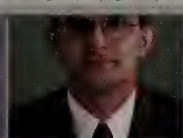
The Web pages and their contents included in this advertisement are fictitious and shown for purposes of illustration only. Any similarity to an actual Web page company name or individual is merely coincidental. © 1996 IBM Corp.

Shopping Account

Week

1k 2k 3k 4k

REPEAT



John Mehler



Valerie Pinder



Philip Francis Nolan

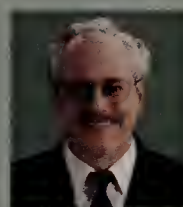
Appraisals

Pension

Training

Medical

Salary



Philip Francis Nolan
Computer Technical Support
Employee ID # 52809
Phone Ext. 7432

Philip Francis Nolan – hired by Megre June 12, 1993, as a computer support manager in the Info Tech division. Previous employment was a similar position at the Grouse Corporation (4/85-6/93). Currently reports to Steve Juliusson, Manager of Computer Services. Nolan has five direct report managers.

It's not enough anymore for CIOs to have good management and technical skills. These days, there's yet another requirement to add to the puzzle: "consulting skills."

The Missing Piece

BY TOM FIELD

Just over two years ago, executives at Hewlett-Packard Co.'s Worldwide Customer Support Organization (WCSO) found themselves in a quandary. The WCSO had its own internal IT support group, but the division's business executives increasingly sought help from external IT consultants. HP financial folks began to question the value—and the

Reader ROI

MORE AND MORE companies are seeking CIOs with consulting skills, but they don't want to hire consultants. This story covers:

- ▶ What consulting skills are
- ▶ How to get them
- ▶ What a CIO can learn from a consultant's approach





budget—of WCSO's IS organization. The problem was that the IS staff was good at providing technology but bad at serving clients. "They would deliv-

recognize when the company's business interests can be better served by external IT help. Rather than displace outside consultants entirely, the IS group simply has ensured that it is now the first choice to provide IT support.

The HP experience is not unique. As technology has spread from the back shop to the desktop, and as the IT client base has expanded, many businesses now want their CIOs to break away from development and service tasks

"With traditional IS people, sometimes the focus is the *problem*, not the customer *facing* the problem."

—Beverly Lieberman

er these applications, and the customers would say, 'That doesn't meet our needs,' to which IS would reply, 'But that's what we *heard* you needed,'" says Michael Kelly, an Ernst & Young LLP consultant brought in to help solve the IS group's problem. "The consultants could see the business problem, as opposed to what they were told the business problem was."

The solution was not to get rid of the consultants, but—in a trend that is catching on in IT-dependent businesses—to make the IS professionals more *like* them. Ernst & Young and Palo Alto, Calif.-based HP created a training program to help the IS staff develop account management and consulting skills—to be more people-focused, more strategic, to anticipate (not just react to) business change. Through this training, IS personnel have come to think of themselves less as service providers and more as account managers, responsible not just for delivering IT but also for partnering with clients to ensure that the technology adds value to identified business needs.

Twenty months into this new approach, client satisfaction is much improved and WCSO's IS organization has justified its existence. "They're much more proactive in seeking new business," says Mary Nur, an HP change management consultant who worked with Kelly. "I see them looking more outside the company at industry trends." Part of the group's success has been what it has done internally, such as helping a unit think through the business issues of an SAP implementation. But another improvement has been IS's ability to

and act more like consultants. Technology isn't the issue with these companies; either they have it or they can buy it from outside vendors. In contrast to the stereotypical IS staffs that write code and run wires, these companies demand IS professionals who possess the kind of softer business and communication skills that external consultants employ to serve a diverse clientele. And frankly, if these companies don't see that level of service internally, they can buy that, too.

And "consulting skills" aren't just a corporate desire; they're a demand. Beverly Lieberman, president of the Stamford, Conn.-based Halbrecht Lieberman Associates Inc., a retained executive search firm that specializes in placing CIOs, says she increasingly is hired by companies that require those skills in new CIOs. "With traditional IS people," she says, "sometimes the focus is the *problem*, not the customer *facing* the problem." Ideally, Lieberman says, companies seek CIO candidates who have, in addition to the classic MIS background, seven to 10 years of multifunctional, multi-industrial experience with one of the Big Six consulting firms or an equivalent business where they have used consulting skills.

Douglas F. Beaven, vice chairman of Symmetrix Inc., a Lexington, Mass., consulting firm that works with organizations—particularly IS departments—to develop new systems and approaches to applying IT (see "Consulting Lesson House Calls," Page 48), says the message from businesses to IS professionals is quite clear. "CIOs who don't pick up the [consulting] skills aren't going to

HP's **Mary Nur** and external consultant **Michael Kelly** developed a program to train the IS group in the ways of consulting.



Raymond Epich put his own credibility on the line to get his boss's buy-in.

last," he says. "They may have jobs, but they won't be CIOs."

But what exactly are "consulting skills"? For the CIO used to hard-and-fast technical terms, this one can be tough to grasp. In short, consulting skills are like good management traits—communication, negotiation, leadership, conflict resolution—but with a key difference: A manager uses these skills to influence people who report to the manager; the consultant tries to influence people over whom he or she has *no* direct control. To apply the definition strictly to IS, the CIO is charged with managing the information assets of the company but then has no control over how business units use the IT components. The challenge is to use consulting skills to influence users, who hold positions both higher and lower than the CIO, in a way that adds value to IS, the client and the business.

The consultant's methodology might sound pretty basic: contract for the job, identify needs, recommend and implement solutions, deal with resistance, assess the aftermath. But when you apply it to typical IS functions, the approach offers some new perspectives for CIOs. Consider contracting, for instance. Usually, IT projects are undertaken with only the vaguest understanding of IS staff

and users' expectations. A consultant, however, works with the client to identify expectations and deliverables up front so that all parties understand their stake in the project's success or failure. Of course, an outside consultant can take that a step further and say, "If I don't meet your needs, don't pay me." The salaried CIO usually can't (and might not want to) say that, but that person *can* say, "If I don't meet your needs, go to an outside vendor." If clients take that option often enough, it's certain that *someone* will stop paying the CIO.

In addition, it might be a traditional CIO's instinct to abandon an IT project in the face of resistance—why build it if they won't come? Whereas, if the project is worth the effort, a consultant will isolate and attempt to quell the opposition, or at the very least try to understand what the clients found objectionable and move forward from there.

A good example of both contracting and fighting resistance comes from Raymond J. Epich, a former CIO with 40 years of IS experience who is now head of the management consulting practice at Interim Technology, a Chicago-based consultancy. Epich once stepped into a

potential snake pit when he replaced a manufacturing-company CIO who had been fired for championing a bad plan to replace the company's mainframe computing system. Upon learning that what the company *really* wanted was to build an automated warehouse, Epich assembled a staff of IS "superstars," built a scale model of the warehouse and presented it to the CEO, assuring him, "You won't fail on this." Putting his own credibility—and job—on the line, Epich promised that his staff, given the financial resources, could and would deliver the project on time and within budget, but he needed equal assurance that he would have the support and cooperation of the CEO and business managers. The CEO, who was under some corporate pressure to deliver the automated warehouse, appreciated Epich's commitment and risked his own credibility by publicly pledging his support to Epich and demanding that junior executives do the same. The two drew up a time line for delivering the project, and Epich set out not just to build the warehouse but to counter the resistance he felt from skeptical business units.

Epich and his team traveled to each of the company's remote sites, met with line managers and listened to their criticism of past IT projects, then assured the people that his IS staff was there not to embarrass or displace people but to

"CIOs who don't pick up the consulting skills aren't going to last. They may have jobs, but they won't be CIOs."

—Douglas Beaven

assist them by applying IT to their business needs. The gesture worked, and the business units helped make the automated warehouse a reality.

Ultimately, Epich found that the best way for a CIO to counter resistance—from above and below—is to establish a track record of meeting clients' needs. "If you can show people in other positions that you can help them be successful, it becomes a win-win situation for everybody, and you build on the small successes," he says.

WE CAN SAVE YOU UP TO 20% ON
YOUR TOTAL COST OF COMPUTING.
IF YOU'RE WILLING TO
**THINK OUTSIDE
THE BOX.**



We're not talking chump change. When you add up basic maintenance, help desk, and other support costs, each PC runs you about \$6,000 over its lifetime. If you've got 5,000 computers, that's \$30,000,000. Ouch. But you can cut that pain by up to 20%. In this case, six million bucks. It's not new math. It's a new way of thinking. Call for our
FREE REPORT 1-800-368-3946.



*Total PC Management.
Because You've Got A Business To Run.™*

Dear Executive:

On February 2-5, 1997, CIO Communications, Inc. and its Partners will host the Fifth Annual **Enterprise Value Retreat** at the Ritz-Carlton Laguna Niguel in Dana Point, California. This Retreat brings together over 200 corporate, government, and business school thought leaders to examine the dramatically changing structure in the IT environment of the late '90s.

The Retreat will be facilitated by F. Warren McFarlan, Senior Associate Dean, Director of External Relations and Ross Graham Walker Professor of Business Administration, Harvard Business School. He will lead participants through the increasingly difficult path of IT acquisitions, with innovative discussions on outsourcing, the CIO as in-house systems integrator, and risk and investment management.

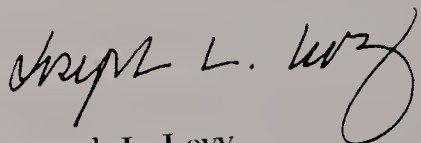
You will participate in a case study with the CIO and CEO of a \$2 billion power cable manufacturing corporation, led by Professor McFarlan. And, John J. Sviokla, Associate Professor of Business Administration, Harvard Business School, will lead a case study on the virtual value chain and the transition from marketplace to marketspace.

Participants are invited to attend the **Enterprise Value Awards Ceremony and Dinner** on Tuesday evening. Proudly underwritten by AT&T Solutions, the ceremony and dinner will honor recipients for their achievements in demonstrating enterprisewide Information Technology benefits.

In 1996, CIOs from companies such as American Express, United HealthCare, Walt Disney Pictures & Television, Honeywell, Safeway, ConAgra, Georgia Pacific, Cornell University, and The Dial Corporation were privy to the most innovative thinking in IT methodology, planning and management. Make this February your opportunity to join this prestigious group of IT leaders and learn the latest methods in finding and defining the value of Information Technology.

Visit our Web site at <http://www.cio.com> for more information. You may also complete and mail or fax the Enrollment Application on the back of the enclosed brochure to 508-879-7720 or call us at 800-355-0246.

Sincerely,



Joseph L. Levy
Group Publisher & President
CIO Communications, Inc.



Lynda Rosenthal
Senior Vice President & General Manager
Executive Programs

Enterprise Value Retreat Partners:

ACXION

ALTEL
INFORMATION SERVICES

AT&T
AT&T Solutions

BOOZ ALLEN & HAMILTON

CABLETRON
SYSTEMS
The Complete Networking Solution™

ENTERPRISE VALUE RETREAT



AWARDS CEREMONY

Join CIOs and other corporate thought leaders from Fortune 1000 organizations for a three day immersion assessing the enterprisewide value of IT and the virtual value chain.

Participate in a case study with the CEO and CIO of a \$2 billion power cable manufacturing corporation. The Retreat will be facilitated by F. Warren McFarlan of the Harvard Business School.



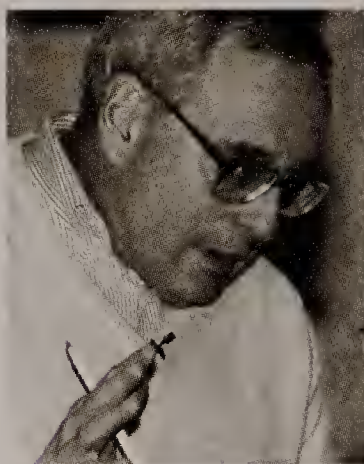
As a Retreat participant, you are invited to be our guest at CIO's Enterprise Value Awards ceremony and dinner to be held Tuesday evening, February 4. The Award recipients are being honored for their achievements in demonstrating ROI from Information Technology.

Proud Underwriter of CIO Magazine's
Enterprise Value Awards



"We are in the midst of a technology discontinuity which is profoundly impacting channels of distribution, market structures, organization of work and service standards. Good management is at the core of success."

— F. Warren McFarlan
Senior Associate Dean
Director of External Relations
Ross Graham Walker
Professor of Business Administration
Harvard Business School



ou will take part in a real-life case study facilitated by F. Warren McFarlan, Senior Associate Dean, Director of External Relations and Ross Graham Walker Professor of Business Administration, Harvard Business School, designed to lead participants through the often tangled path of Information Technology acquisitions. From conception to implementation, you will learn how to justify costs, budget more effectively, sell ideas to internal management and users and gain a better understanding of the enterprisewide strategic implications of your decisions.

SUNDAY, FEBRUARY 2

8:00AM-10:30AM	Registration and Breakfast
12:30PM	Golf Tournament at Monarch Beach Golf Links
3:00PM-6:30PM	Registration
6:30-7:00PM	Retreat Introduction
	F. Warren McFarlan
	Senior Associate Dean
	Director of External Relations
	Ross Graham Walker
	Professor of Business Administration
	Harvard Business School
	Join Retreat participants in an event synopsis
7:00PM-10:00PM	Partner's Cafe
	Meet other participants and Retreat Partners

Enterprise Value Retreat Partners:



AT&T Solutions

BOOZ ALLEN & HAMILTON



MONDAY, FEBRUARY 3

- 7:30AM-8:15AM Breakfast
 8:15AM-8:30AM Welcome and Opening Remarks
Joseph L. Levy
*Group Publisher & President
 CIO Communications, Inc.*
 8:30AM-10:00AM Managing in the Marketspace
John J. Sviokla
*Assistant Professor of Business
 Administration
 Harvard Business School
 Implications for the CIO of shifting
 from marketplace to marketspace*
 10:00AM-10:30AM Mid-Morning Break
 10:30AM-11:15AM Exploiting the Virtual Value Chain
John J. Sviokla
*Showing how to extract value in
 "place" and in "space"*
 11:15AM-12:00PM Cybersmith Case Study
John J. Sviokla
*Examine this tech-retail-store-cafe
 entrepreneurial Web venture*
 12:00PM-1:30PM Luncheon
 1:30PM-2:30PM Concurrent Sessions
*Choose among several sessions
 offered by our Partners*
 2:45PM-3:45PM Concurrent Sessions—Repeated
 4:00PM-5:00PM Summation of day's case study and
 preview of Tuesday's case study
 6:30PM-7:30PM Partners' Cafe
*Meet other participants and Retreat
 Partners*
 7:30PM Dine Around or Captain's Table

TUESDAY, FEBRUARY 4

- 7:30AM-8:15AM Breakfast
 8:15AM-10:00AM Business Process Redesign and the
 Role of Intranets
F. Warren McFarlan
*Changes in infrastructure being facili-
 tated by today's new technologies*
 10:00AM-10:30AM Mid-Morning Break
 10:30AM-12:00PM Enterprise Value Case Study:
 Southwire Corporation
F. Warren McFarlan
*View, in depth, this privately-held \$2
 billion power cable manufacturing
 company*

- 12:00PM-1:30PM Luncheon
 1:30PM - 3:45PM Case Study Workgroups
*Break into small groups to develop
 the case*
 4:00PM-5:00PM New Ways of Assessing IT Services
F. Warren McFarlan
*New reflections on the make/buy
 decision*
 6:30PM-7:15PM Enterprise Value Awards Reception
Meet the Award winners and judges
 7:15PM Enterprise Value Awards Ceremony
 and Dinner
*Join CIO and AT&T Solutions in
 recognizing the winners of the
 Enterprise Value Awards*

WEDNESDAY, FEBRUARY 5

- 7:30AM-8:15AM Breakfast
 8:15AM-9:15AM Case Study: Roundtable Presentations
 and Discussion
F. Warren McFarlan
Examine breakout solutions
 9:15AM-10:00AM Case Study: Epilogue and Reflections
F. Warren McFarlan
Roy Richards, Jr.
*Chairman and CEO
 Southwire Corporation*
Lee Hunter
*Vice President
 Environmental & Technical Support
 Southwire Corporation
 Review case decisions with
 company executives*
 10:00AM-10:30AM Mid-Morning Break
 10:30AM-11:45AM Delivering IT Results in the
 Information Mediated Age
F. Warren McFarlan
*Techniques and processes for
 ensuring attractive bottom line results*
 11:45AM-12:00PM Summary
F. Warren McFarlan

Reservation Form on Back Page

ENTERPRISE
VALUE
RETREAT

February 2-5, 1997
Ritz-Carlton Laguna Niguel
Dana Point, California

ENROLLMENT APPLICATION

Please complete the enrollment form in its entirety.

Name _____ Telephone _____

Title _____ Facsimile _____

Organization _____

Address _____ Mail Stop _____

City, State, Zip _____

E-Mail Address _____

I will bring a companion. Name: _____
(A companion is included at no cost)

HHL HHL2 TID1 TID2 TIJ2

What is...

Your industry? _____

Your organization's annual revenues or assets? _____

Your annual IT budget? _____

The title of the person to whom you directly report? _____

Which of the following statements describe your personal involvement in the acquisition of information technology products and services for your organization? (Check all that apply)

Do you... ☐ Identify or establish the need
☐ Initiate the purchase
☐ Evaluate brands

☐ Specify/recommend brands or vendors
☐ Authorize the purchase
☐ Approve the budget

Fee: ☐ **\$2,250** IS Practitioner/Executive
Please make your own hotel reservations.
☐ **\$2,850** Government/Military
This fee includes your hotel for three nights. CIO
will make your hotel reservations for arrival
Sunday, February 2 and departure Wednesday,
February 5.

☐ Bill company
☐ Check enclosed
☐ MC/AX/VISA (circle one)

Acct. # _____

Signature _____

Your fee includes Retreat attendance, Retreat-related materials, meals, entertainment, companion attendance and the Enterprise Value Awards Ceremony and Dinner.

Please make your hotel reservations by calling the Ritz-Carlton at 714-240-2000.

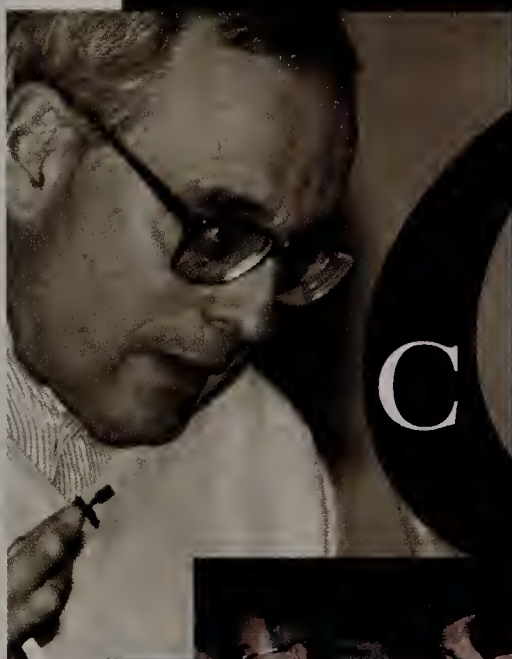
Be sure to mention you are attending CIO's Enterprise Value Retreat to receive the discounted rate of \$215.00 per night. CIO will make hotel reservations for government/military only. All fees must be paid prior to the Retreat. No refunds or cancellations will be given after January 17, 1997. CIO reserves the right to limit attendance to practitioners and Partner organizations.

To enroll visit our Web site at <http://www.cio.com> or
fax this completed form to us at 508-879-7720.

ENTERPRISE VALUE RETREAT



"We are in the midst of a technology discontinuity which is profoundly impacting channels of distribution, market structures, organization of work and service standards. Good management is at the core of success."



AWARDS CEREMONY



Join CIOs and other corporate thought leaders from Fortune 1000 organizations for a three day immersion assessing the enterprisewide value of IT and the virtual value chain.

Participate in a case study with the CEO and CIO of a \$2 billion power cable manufacturing corporation. The Retreat will be facilitated by F. Warren McFarlan of the Harvard Business School.

Proud Underwriter of
CIO Magazine's Enterprise
Value Awards



AT&T Solutions

What's Skill Got To Do With It?

Walking the consultant's walk is easy if you know where to learn it

SOME CONSULTANTS like to think their skills are intuitive, but at least two professional associations provide consultative training for IS professionals. The American Management Association of New York offers a three-day seminar on improving internal consulting skills, while the Chicago-based Society for Information Management (SIM) soon will launch a new Executive Exchange program.

"Our customers have identified that they need these skills to be successful," says Cheukping Shiu, program manager for AMA's seminar, which seeks to improve participants' proficiency in communication, needs analysis and project management, among other skills. The seminar, offered throughout the country several times a year, is recommended for all IS professionals and can accommodate as many as 30 partici-

pants per session. For more information, call 800 262-9699.

The Executive Exchange sessions, which SIM will introduce in early 1997, are designed to operate about two levels higher than SIM's regional learning forums, which are geared toward junior and mid-level managers. The focus, says Executive Exchange creator and SIM executive board member Dick Dooley, is on communication, change management, work habits and the synthesis of business and technology. Industry leaders will direct discussions at these three-day sessions, five times a year—with participants required to attend three out of the five. "The focus is not so much skills as capacities," Dooley says. "I think we will shift some people's habits."

For more information about Executive Exchange, call SIM at 312 644-6610 or visit www.simnet.org. —T. Field

A CIO can ply consulting skills at several different levels throughout the enterprise. In the executive suite, where the CIO must persuade peers and superiors that IS adds value to the business strategy, the consultant's communication skills come into play, helping the CIO frame IT issues in business terms. At the operations level, where IT implementation is the key, the CIO can help the IS staff go

beyond needs assessment and try to influence how client *think* about needs, assuring them that IT projects are not only valuable to the client but achievable and maintainable by IS. Finally, by implementing projects successfully and responding to client feedback, the CIO can improve the image of IS within the organization and even repair damage done by previous administrations.

Jon Bridges, a former consultant with Andersen Consulting, is the senior director of information technology at the \$500-million Atlanta-based Chick-fil-A Inc. restaurant chain, where he finds his consulting skills valuable in his position as the company's senior IS executive. "My job hasn't really changed," says Bridges, who left consulting because he was tired of travel. "I just do it for the same company all the time."

At Chick-fil-A, Bridges says, he encountered two challenges: prove the value of IS, which previously was a subfunction of accounting, and overcome the apprehension of some staff who feared

he would enforce a high-intensity, 90-hour standard work week in the department. To address both issues, Bridges set an example through his diligent-but-reasonable work habits and by seizing, rather than waiting for, the opportunity to make IS a major player in the company's competitive strategy. Chick-fil-A identified food and labor costs as key metrics in restaurant management, so Bridges became part of a team to develop a new, chainwide shared information system to track administrative functions throughout the company—a first step toward tracking those food and labor costs.

After securing executive support for the system, Bridges enlisted field consultants, financial analysts and store managers as part of the IS development team to identify and incorporate everyone's needs in the system design. "It was critical," Bridges says of the cross-functional teamwork. "We had to get the agreement that the result [of lower costs] was worth it, and we had to have the buy-in from the stores." By giving the departments some ownership of the project, Bridges was able to meet their needs and facilitate a successful system rollout. And he also helped the IS staff become more comfortable working both with him and with business-side peers. That success gave the IS department a solid hit in its first at-bat, and it gave Bridges credibil-

Jon Bridges applied his consulting experience to Chick-fil-A's shared information system.





LIBE

JAVA™

No blood will
be shed in
this revolu-
tion,
just a lot of
preconceived
notions.

RTY!

The era of Java™ Enterprise Computing
is at hand. No longer will we be
tied to a single master. As
of today we consider the
following to be inalienable
and available to all.

The right to create solutions,
which were before today, not
simply impossible, but
inconceivable.

The right to integrate all your
disparate systems into a cohesive
functioning network. It is
time to eliminate your application
backlog and bask in the freedom
of writing an application once
and running it anywhere. No
longer will you be burdened by
any client administration. It
is your due, you are owed a
dramatic reduction in the
cost of ownership. We stand united.
Java Enterprise Computing is here
and it will

set
you free.

<http://www.sun.com/liberty> or
1-800-786-0785, Ext. 470.

THE NETWORK IS THE COMPUTER™



ity within the organization. He has since been pulled into such projects as menu development, new products and corporate communications, and he has helped create a new financial system, logistics system and a data warehouse.

John J. Alexander, a former financial industry CIO who now heads Business Technology Consulting Inc. in Portland, Maine, says he began to develop a consultative approach to IS issues in 1969, when he had to mend fences broken by an ineffective CIO at the New York Stock Exchange. The previous CIO had championed too many unworthy IT causes and was fired, Alexander says, leaving the IS reputation in ruins. To start rebuilding, Alexander first identi-

fied how IS could add value to the business, which turned out to be by automating the stock exchange's "odd lot switch" (an "odd lot" is an order for any nonmultiple of 100 shares of a company's stock). Without automation, transactions had to be recorded manually by 80 inventory control clerks; with automation, the process could be done far more efficiently and accurately. After assessing the needs and determining the solution, Alexander concentrated on how to sell the project to a skeptical client. The key, he found, was to downplay the odd lot switch's technical merits. Instead, when he appeared before the NYSE board of directors and member brokers, he spoke of potential space savings, the ability to route orders automatically—

and the savings from eliminating the 80 inventory control jobs. The sales pitch worked. The NYSE funded the project, which was implemented successfully, Alexander helped secure significant savings for the NYSE and, in so doing, blew away the dark cloud left by the previous CIO.

Other than becoming a consultant, how can one develop consulting skills? Going back to school is the first answer. Alexander and other consultants say an undergraduate technical education and post-graduate business degree—or the reverse—are a good foundation upon which to build consulting skills. Business experience is the next step. Ernst & Young's Kelly spent several years in the business field, learning the culture and the language, before he took his pre-

Consulting Lesson House Calls

Symmetrix provides on-site advice

IF YOU CAN'T DESIGN your own school for consulting skills and you can't get out of the office to find one, there's at least one program designed to bring the consulting skills mountain to your IS Mohammed.

Symmetrix Inc. in Lexington, Mass., a 10-year-old consulting firm, sends its team of managers, technologists and psychologists on-site to work with cross-functional client teams. The consulting firm examines from the inside how a company's systems and processes might be improved. Part of that diagnosis involves "shadowing" IS professionals to see how they do their jobs and to suggest ways they might boost their influence. "The premise is, if we bring a suite of skills to the table together, we can get much greater results," says Symmetrix President Don C. Hawley.

Often, Symmetrix consultants find IS staff so overwhelmed by servicing equipment and maintaining their own competency that they don't even make time to consider some of the strategy and people issues. "The overwhelming tendency is for the urgent to outweigh the important," Hawley says. The Symmetrix approach is to direct IS professionals—particularly CIOs—to be more like consultants, to delegate some of the basic maintenance work and concentrate more on understanding and serving their own clients' business needs. "It's a mindset shift," says Randy Cole, vice president of the property and casualty practice at Symmetrix. "The focus has to be from the customer in, rather than the machine out."

A typical challenge, according to Jan Hopland, vice president of the IT practice at Symmetrix, occurred recently at a large manufacturing company where IS and finance were at odds over a \$12 million systems integration plan. IS believed the business needed the system, but it failed to make a persuasive business case to the finance department. "They were just talking past each other," Hopland says. When faced with such conflicts, he explains, Symmetrix first coaches IS to ask its business partners what they want to do and then helps build the technology to support that scenario.

The Symmetrix/client teams work together at the client's site Monday through Thursday, and then the Symmetrix consultants return to Lexington for their "Friday Forum," a brainstorming session in which all employees present, analyze and debate issues about current projects. Ultimately, Symmetrix offers its clients new processes, strategies or even custom-built IT systems.

When dealing specifically with IS, Symmetrix often finds resistance from technologists who struggle with such "soft" skills as listening, reacting constructively and offering feedback. "The hard stuff is the soft stuff," Hawley says. But if IS professionals can overcome those challenges and create new solutions, the results can redefine their entire business/technology perspective. "You've got to look at ROI in a different way," Hawley says. "It's not return on investment but return on information."

—T. Field

What
FREEDOM
looks
like.



JAVASTATION™

That not-very-boxy box pictured above is the new network computer from Sun. Now, we're not going to get into speeds and feeds other than to say it probably performs as well as or better than what's on your desk right now. But

that's where all comparisons end. Because this, folks, is **the computer of the future.**

You see, with JavaStations on your intranet, the bulk of your computing power resides on the network. Which means you can deploy and manage applications from one central location.

We're talking unprecedented cost savings per seat, ease of administration, built-in security and global software compatibility.

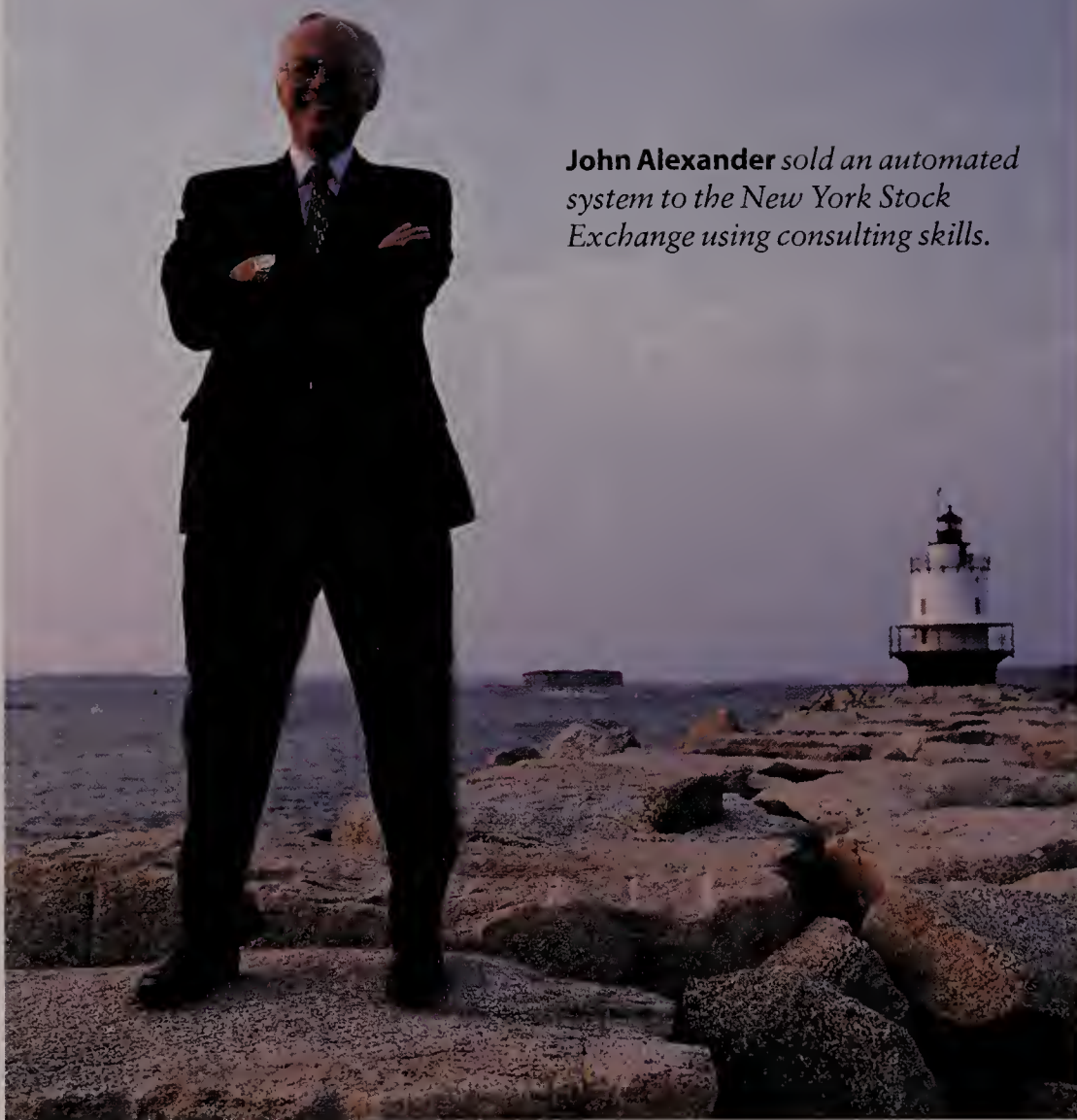
Plus, thanks to the Java™ platform's independence, there's no risk to your current investment in hardware or software. So, the question isn't are they going to catch on (over 60 percent of the Fortune 1000 companies are already using Java technology). It's more like, when are you?



For more information contact us at <http://www.sun.com/station> or 1-800-786-0785, Ext. 475.

THE NETWORK IS THE COMPUTER.





John Alexander sold an automated system to the New York Stock Exchange using consulting skills.

consultant job as CIO of the State of California's Employment Development Department. For CIOs who are on the job and want to add consulting to their list of skills, management associations and consultancies offer specific non-degree courses that can help (see "What's Skill Got To Do With It?," Page 46). And then there are companies such as HP that now offer their own internal IS consultant training.

For several years, MIS Consulting Skills had been a required course for IS staff at Reader's Digest Association Inc. in Pleasantville, N.Y. The training was based on the in-house IS and human resources training expertise and some principles noted in management consultant Peter Block's book *Flawless Consulting* (Pfeiffer & Co., 1981). Mixing the in-house knowledge with Block's broad business approach to an IS-specific model, Reader's Digest developed a curriculum that trained many of the U.S., U.K. and Canadian staff members in such areas as contracting, diag-

PHOTO BY JEFFREY STEVENSEN

THE ROAD TO BUSINESS-DRIVEN INFOR



CHOOSE A PARTNER WHO KNOWS THE WAY. The competitive edge delivered by today's advanced distributed technology is critical. But the costs can be outrageous – as much as ten times purchase price to maintain and service the average desktop. That's why IT executives are being

squeezed so hard to get control over spending and achieve business-driven solutions instead of just high-tech fashion shows. ¶ As a multi-billion dollar worldwide provider of technology management services, Inacom uses a tough, business-driven approach to managing distributed technology

nosis, feedback and implementation. The training took several days, but the payoff justified the effort, says Dick Brant, vice president of MIS in the United States. Reader's Digest is now in the process of reviewing the present curriculum and developing new parts of the training. "We don't measure ourselves 'with' [the training] and 'without,'" Brant says, "but I know it allows our people to provide a more professional level of service. They understand the business better and help our users achieve their goals."

One result of the consultative approach, Brant says, is an IS/business collaboration that resulted in a new mailing label system. That system helped the company qualify for discounts the U.S. Postal Service offers to companies that print information such as nine-digit ZIP codes and delivery routes on their labels. The system has made it easier for the Post Office to deliver Reader's Digest products, and it has saved the company countless dollars. Because of that sav-

ings, the IS reputation has skyrocketed within the company. A reciprocal benefit is that IS personnel now find greater value in their business-side peers. Before, the IS staff was stereotypically proprietary about IT issues, Brant says. But now it actually welcomes technical input from non-IS staff. Particularly in desktop publishing, where some of the clients know the current technology better than the trained technologists, IS now is willing to tap non-IS resources to develop new systems.

Of course, despite all they can learn from consultants, CIOs should recognize that they *already* have several advantages that consultants don't to help them get the job done well. CIOs are insiders; while they bear the brunt of office politics, they also know the people and potential political land mines in a way no outsider could hope to grasp quickly. Likewise, CIOs are comfortable with the

ebb and flow of business life—the high-energy periods and the low—while consultants tend to work project-to-project. Also, consultants' relationships with clients are relatively brief. CIOs, on the other hand, have a much more vested interest in projects and initiatives that affect IS since they will be around for the long haul—or so they hope. Finally, in contrast to the consultant who lives out of a suitcase, a CIO is better able to establish corporate roots, which one needs to influence an organization positively in the long term.

"It's a lifestyle change," says Chick-fil-A's Bridges, who admits it has been a unique challenge to move from consulting to IS. "If you're a consultant and something doesn't go well, you go to the next client. Here, the relationships are permanent. You've got to remember that you're going to live here when the project is done." **CIO**

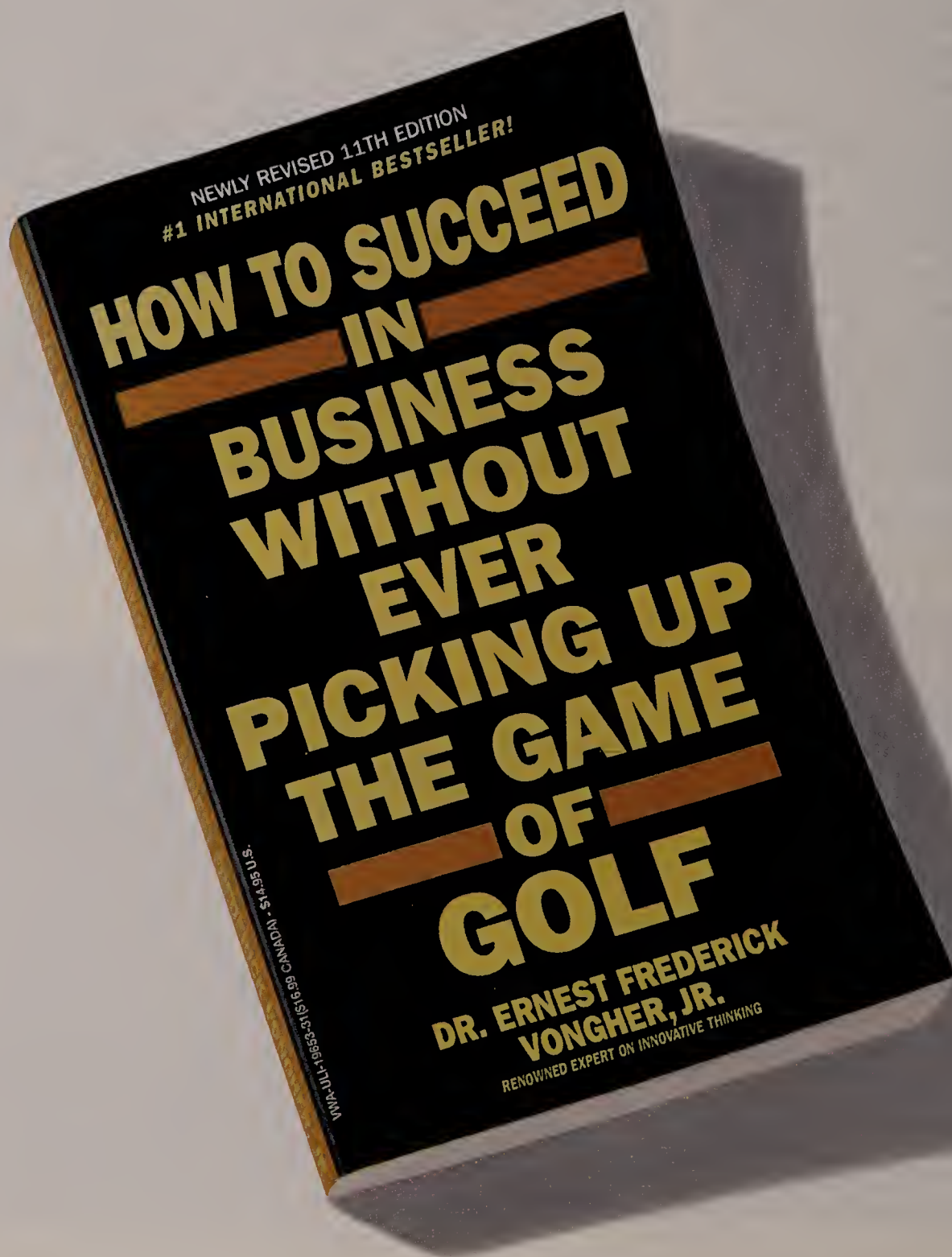
Staff Writer Tom Field can be reached at tfield@cio.com.

INFORMATION TECHNOLOGY IS HAZARDOUS.

and puts you in control of your enterprise. Nobody else does this as well, or as efficiently – one cohesive structure from design and procurement to support and asset management. Inacom was the first to earn ISO-9001 quality certification. And we are the first to bring the complete, business-

driven mindset to distributed technology.  If you're absolutely positive your computer and communications systems are delivering every ounce of productivity you paid for, we salute you. If not, we should talk.





OR

The NEC Versa 6000 Series
133MHz Pentium® Processor
PCI and CardBus Architecture
16MB RAM
1.44GB Hard Drive
12.1" 1024 x 768 TFT Display
Full-Screen MPEG Video
Swappable 6X CD-ROM
28.8 Data/Fax/Voice Modem
Lithium Ion Battery



NEC VERSA 6030X

Presenting
the NEC Versa® 6000
Series. The Versa 6000H, 6010H
6030X and the recently acclaimed Versa
6030H -- Byte Magazine's "Best of Byte" for Pentium
Processor-based portables, and INFOWORLD's pick as the leading
133MHz Pentium Processor notebook. With their sophisticated arrangement of,
powerful, state-of-the-art features, every NEC Versa in the 6000 Series will
allow you to get ahead by improving your productivity, not your handicap.

SEE, HEAR AND FEEL THE DIFFERENCE™

NEC

The Integration Backlash

PART 2

MESSAGE BROKERING

A Smarter Linking Logic

This revolutionary approach to IS architecture might be the future of systems integration

BY CHRISTOPHER KOCH

When Bobby Cameron thinks back to his days as a programmer for a New York bank, he has pizza flashbacks. "We used to spend a lot of weekends locked in our offices with pizzas slipped under the door to keep us going," says Cameron, who is now a senior analyst in the packaged application strategies service of Forrester Research Inc.

Cameron liked pizza well enough, but after a while the aroma of mozzarella became inextricably linked to rushed deadlines and frantic sessions of code writing. Cameron usually made the Monday morning cutoff, but at a cost. Each new piece of code, each shoehorned application, added more complexity to the system. The more weekends Cameron spent patching things together, the harder the next modification became. But there was no avoiding it. The system had to keep up with the bank's constant onslaught of new financial products.

"That's the rub," says Cameron. "There's a destructive complexity that comes from connecting applications together with chewing gum and baling wire. It's cheap and fast to build those connections, but the challenge comes when you realize, 'Well, I may have to redo it tonight to meet the new business needs.'"

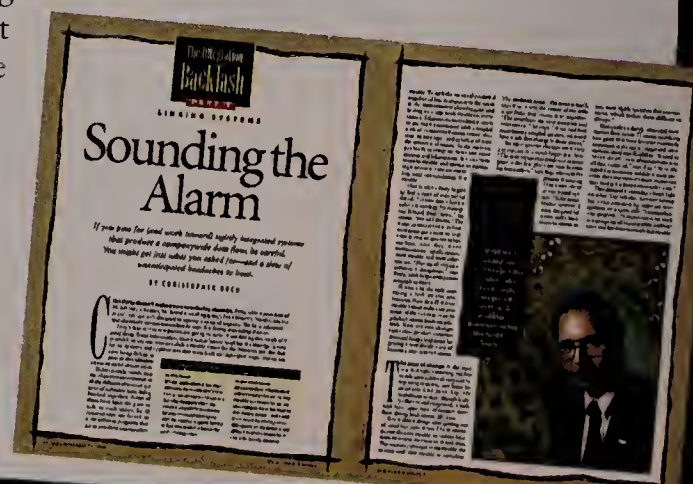
Since the demand for new applications and the dependence on old applications will never go away, IS needs something more enduring and less messy than chewing gum to glue

The Integration Backlash

In **Part 1** of our series in the Nov. 15 issue, we looked at how linking multiple applications and platforms directly to each other can lead to a tangled, inflexible mess. See www.cio.com/CIO/111596_alarm.html for the full story.

Here, in **Part 2**, we examine a different approach to systems architecture that might be the future of integration.

For case studies on companies that are using this message brokering approach, see **Part 3**, Page 64.



together the staggering array of different applications, computer platforms (mainframe, client/server, PC) and operating systems contained within the walls of a typical large company. The din of different languages and protocols that those components use to communicate would make the Tower of Babel seem a paragon of clarity. These different components need a third party—a sort of master translator—to enable them to talk to each other.

That third party is neither a technology nor an application; it's more like a new place, a layer within the computing architecture where messages from one application are translated into a format that other, completely unrelated applications can understand. Gartner Group Inc. analyst Roy Schulte, vice president of the system software architecture service, has dubbed the concept "message brokering" because the third party acts as a broker of sorts between the various components of a computer system. Potentially, that approach can solve many of IS's integration headaches and at the same time reduce some of the impatient foot tapping that plagues the relationship between the business and IS.

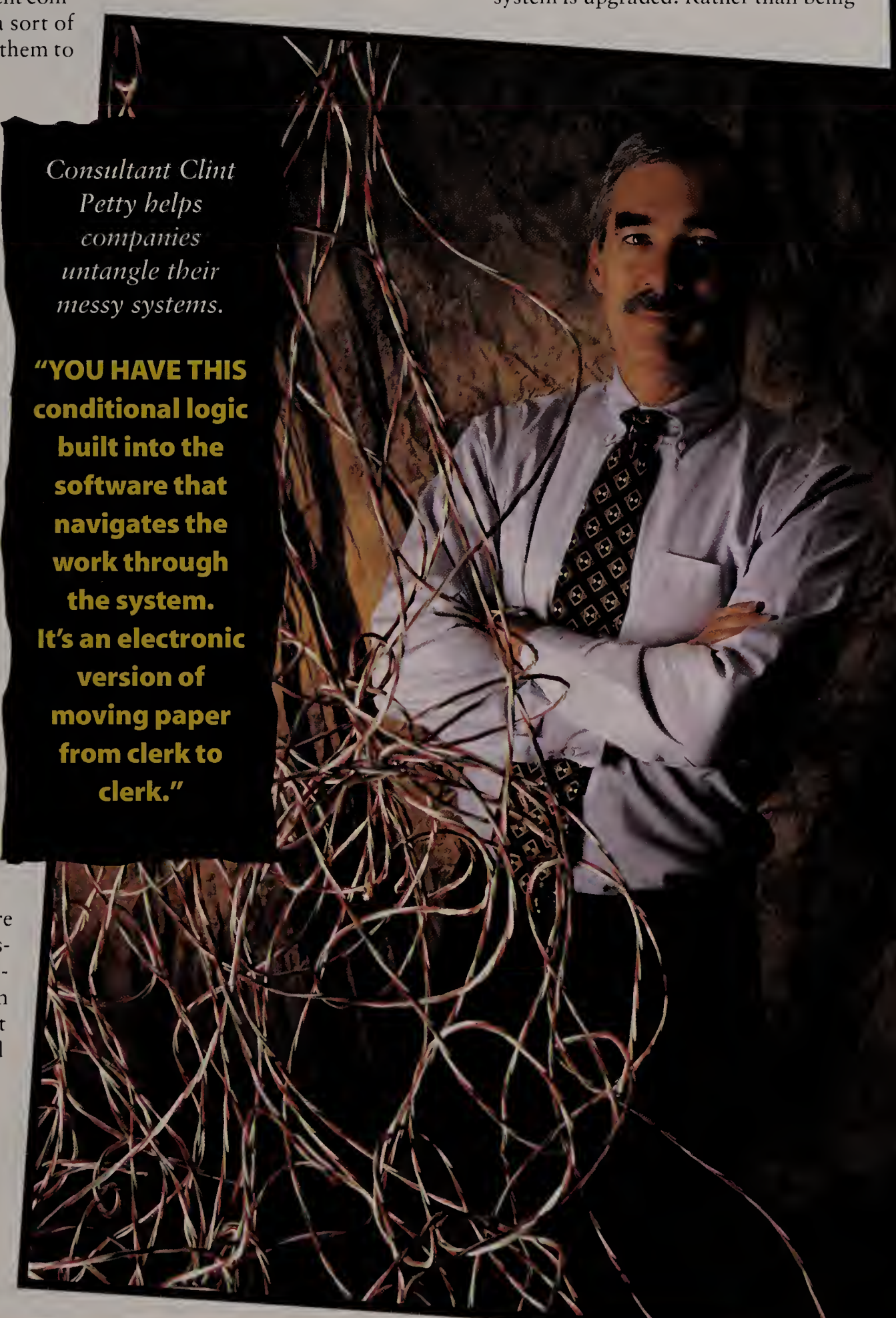
A good way to visualize message brokering is to compare it to the "hub-and-spoke" model of the airline industry. Before the hub-and-spoke system was devised, airlines flew directly between all the cities in their networks, which meant keeping enough planes and crews in each city to service the scheduled flights. With the advent of the hub, airlines had a convenient convergence point for planes and crews so that they could be deployed as needed. Adding new flights to the network also became easier—just establish a connec-

tion to the hub city.

Most computer systems today look like the old, direct-connection airline system, according to Johan Vinckier, Brussels-based practice principal at McKinsey & Co. Different applications and systems in the network are connected directly so that they can exchange

information. When an application is added to the network, individual connections must be built to every other application in the network, creating a jumble of messy links.

A software "hub" eliminates the need to tear apart and rebuild all those links each time an application is changed or a system is upgraded. Rather than being



Consultant Clint Petty helps companies untangle their messy systems.

"YOU HAVE THIS conditional logic built into the software that navigates the work through the system. It's an electronic version of moving paper from clerk to clerk."

connected directly to one another, the various components are connected to the software hub, which acts as a message broker between the system, its various applications and users. When a new application enters the fold, it is linked to the hub—often reusing the existing hub code—while the other applications remain untouched. Users still receive integrated data, but IS isn't working and eating pizza all night to get it to them. "You need tight integration, but you need it to be enabling change rather than resisting change," says Cameron.

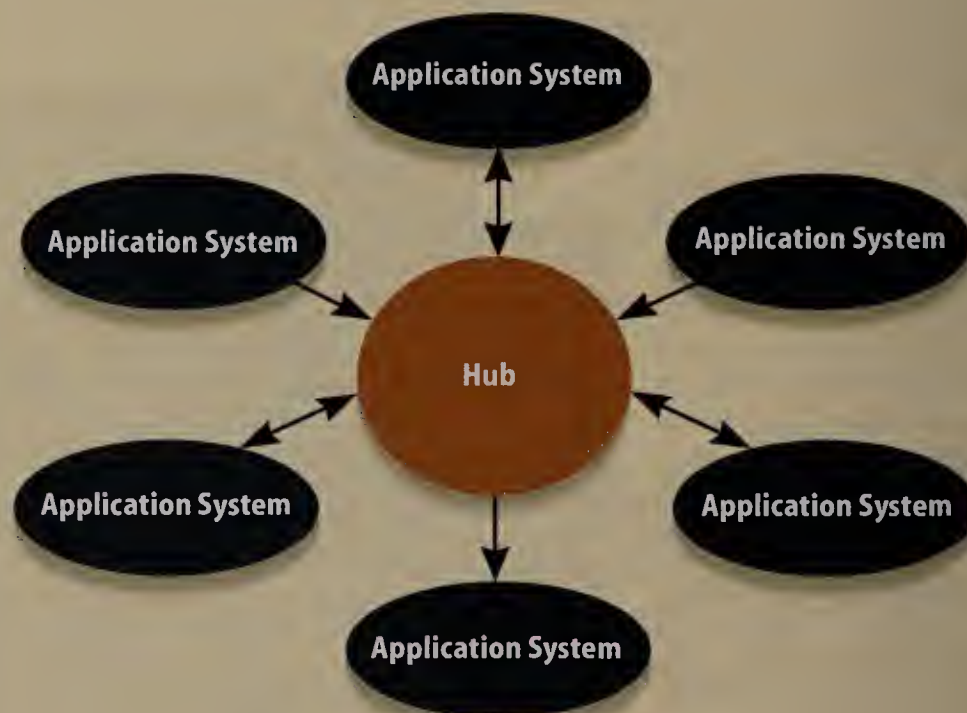
The concept is also capable of improving the financial health of the company. For example, using the hub-and-spoke system, a bank customer service call center can access a customer's entire portfolio of accounts (checking, loans, mortgage, etc.) from a single terminal, even though those accounts may be contained within several different computer systems that speak different languages. The hub dives into the different systems and scoops out the relevant chunks of information, assembles them and translates the package into a format that the user's PC can read. When the rep makes changes on the PC screen, the hub delivers the new information to the different spoke applications and updates the entire system. The net effect is a dramatic reduction in cost: Reps can take more calls, and they spend less time on the phone with each customer.

But experts say there's more to the hub's potential than cycle-time reduction and cost savings. The hub also can be programmed to arrange the steps in a particular business process. "This is where you say, 'I'm not just going to use [the hub] to manage an event; I'm going to use it to manage a process,'" says Clint Petty, president of DCMS Inc., a Reston, Va.-based consulting group that specializes in developing hub-and-spoke architectures. "You have this conditional logic built into the software that navigates the work through the system, making logical decisions at each step. It's an electronic version of moving paper from clerk to clerk."

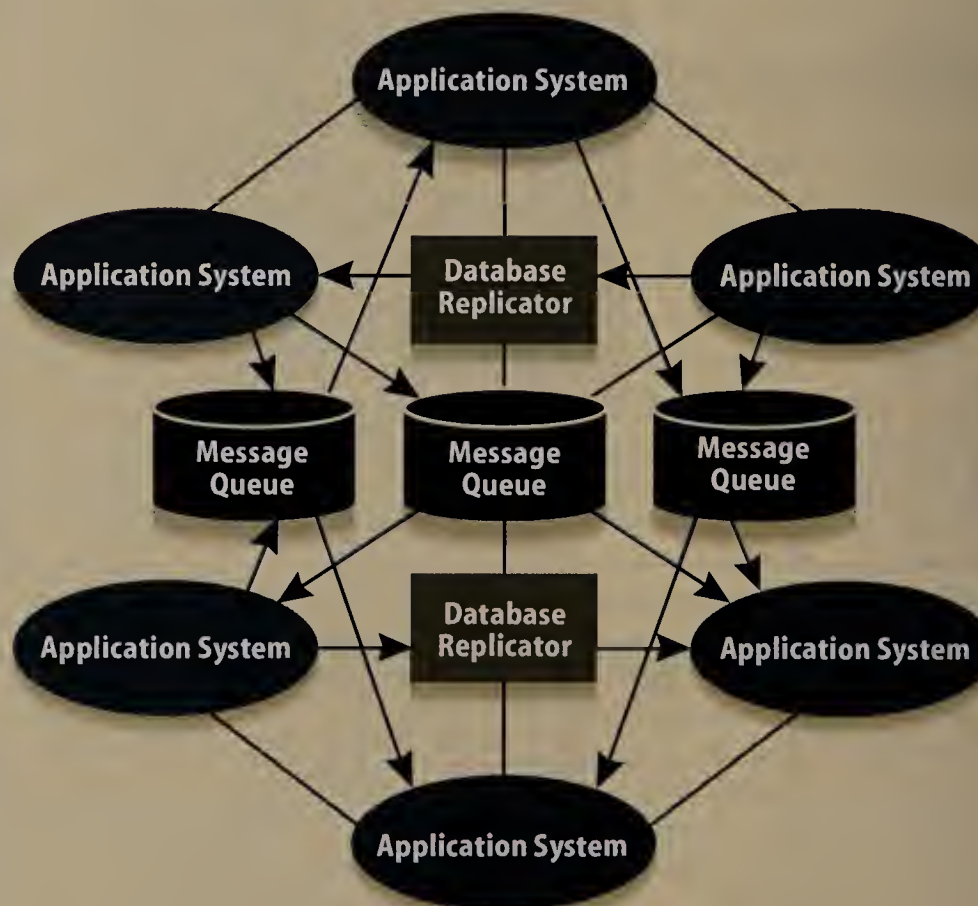
For example, the hub can be programmed to understand the various steps that reps must complete to submit

The Simpler Life

The hub-and-spoke architecture of message-brokering routes data to a central place for distribution



Traditional integration links systems, platforms and applications directly with multiple links and "pit stops" for data



SOURCE: FORRESTER RESEARCH INC.

How do you manage your most important assets?

**MEETING
MAKER®**

Client/Server,

Cross-Platform

Group Scheduling

for Mission-Critical

Environments

Time & People.

To manage time and people efficiently, you need an enterprise group scheduling solution that provides reliability and scalability. You need Meeting Maker. ■ Meeting Maker's client/server architecture is designed to work in mission critical environments and will scale to

fit the demands of your growing organization. Whether you have Windows, WinNT, Win95, PowerMac, Macintosh, OS/2, UNIX or DOS, Meeting Maker will work with all of them.

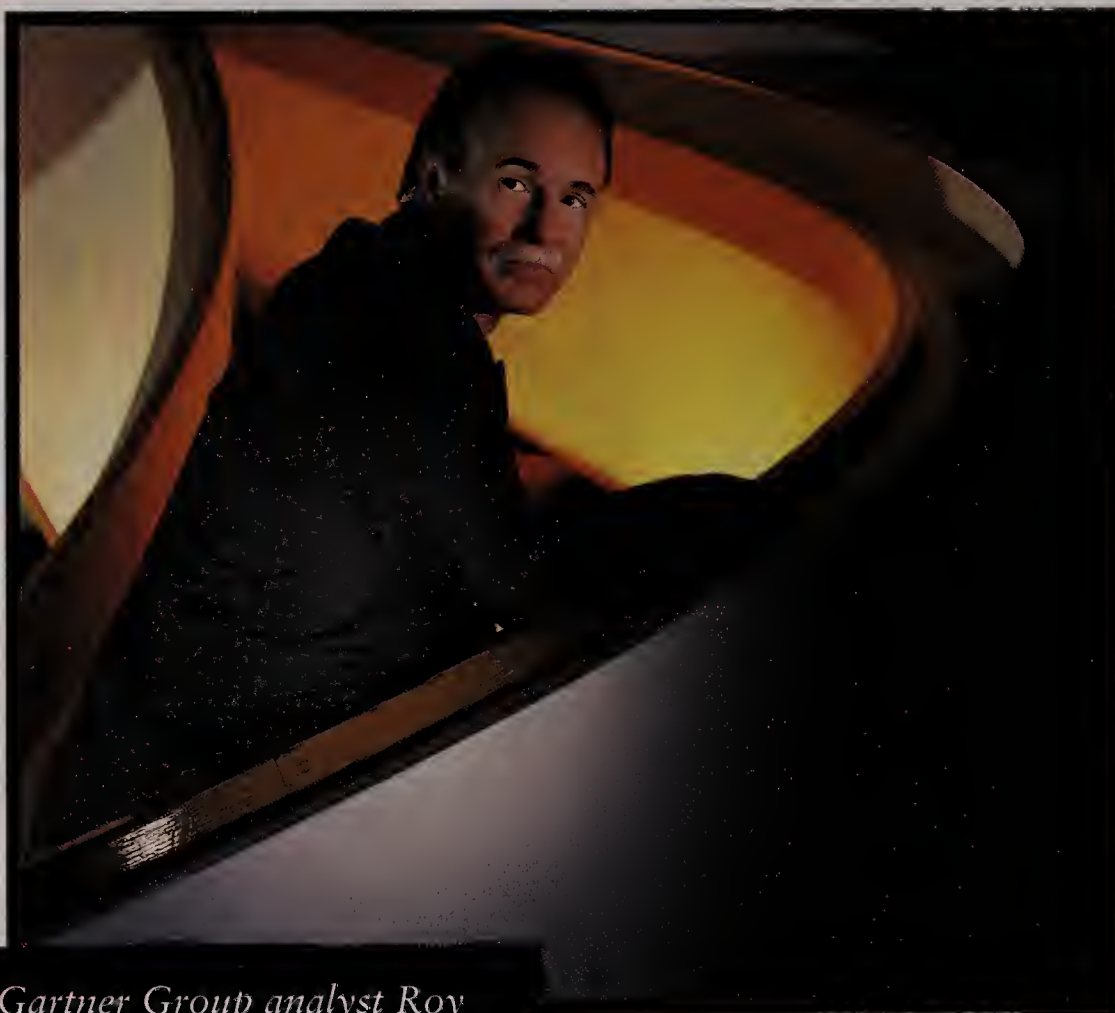
■ Help your people manage their time better with Meeting Maker.

Call (800) 754-5260

for your free "Strategic Perspectives on Group Scheduling" Study

www.on.com/mmexp/mm1home.html





Gartner Group analyst Roy Schulte coined the term "message brokering."

"THE ABILITY to reuse some of the work is a clear payoff."

an application for a car loan. If the application is completed by a rep in the bank's call center, the hub can automatically access the customer's credit card accounts to retrieve credit information. The hub can then send a prompt to the rep based on what it finds (maybe offering an instant credit-line increase to seal the deal, for example).

If the process changes, the hub easily can be reprogrammed to reflect the change. That is reengineering refined to the point where changes to business processes can be made independently of the technology infrastructure. Because changes are made within the hub rather than within individual applications or computers, users often don't even know changes are taking place, which eliminates the jarring organizational impact that usually comes with system over-

hauls. Reengineering becomes more iterative, more continuous—and a lot less disruptive.

Though the hub may sound like a kind of virtual Mensa society, the technology isn't that much of a stretch, Petty says. The real challenge in hub-and-spoke architectures is creating a solid set of business rules to govern the flow of messages. "This is not point-and-click technology," he says. "It's still just an expression of business rules. The only difference is that this exists as intelligence within the network as opposed to belonging to a specific application group."

Though there is no such thing as an off-the-shelf message-brokering technology, some of the components for a hub-and-spoke architecture are coming from the emerging segment of "messaging middleware" vendors. But Schulte argues that companies should focus on the architecture rather than the tools. "Until there is a universal dictator of middleware and semantics—which will never happen—message broker [architectures] will be useful," says Schulte.

Unfortunately, there's a big gap between "useful" and actual use, espe-

Does Your Company Need Messaging?

Some criteria to decide whether this technology applies to you

Companies that use messaging successfully have some critical characteristics in common:

- 1.** Heavy use of production and transaction-oriented applications—messaging is not meant to replace data warehouses and other decision-support technologies.
- 2.** Complex application portfolios with a diverse, incompatible mixture of new, old and packaged applications that must communicate.
- 3.** Applications that must communicate frequently—every few seconds, minutes or hours.

SOURCE: ROY SCHULTE, VICE PRESIDENT FOR THE SYSTEM SOFTWARE ARCHITECTURE SERVICE, GARTNER GROUP INC.

cially when it comes to technology. For now, hub-and-spoke architectures are a tough sell, both to vendors and consultants (who make a living from, among other things, system upgrades and replacements), and to the business, which generally dislikes arcane technical concepts and fuzzy ROI. Infrastructure just isn't very sexy. "It's tough to get the CEO excited about messaging middleware," admits Vinckier. "Connectivity is typically something that no business person would concern himself with. [But] the business must understand that managing the hub is more important than what type of planes you fly. IS will have to deal with chaos continually and will have to bring different systems together all the time, so you have to manage that separately."

The value of managing integration as a separate discipline will not be apparent right away, either. "The cost of con-



Busy international connector

Today, every flight is a connecting flight. Behind an airport's passengers and cargo are endless streams of voices and data connected and moved by sophisticated communications networks. Because we see these high-speed networks as logical extensions of electronic connectors, AMP plays an important role in this unseen, but critical process. You'll see AMP innovation in our networking products, which include cabling, computer interface cards, hubs, routers, switches, fiber optics, and wireless components. Just as important, you'll also see it in the way we integrate these technologies, to help bring our customers greater connectivity, higher bandwidth, lower maintenance costs and a longer useful life for their networks. You may never think of an airport as a "connector." But the networks that control your city's air traffic, finances, and communications will work better because we do.

Connecting
at a
HIGHER
level.™

AMP Incorporated, Harrisburg, PA 17105-3608. Contact your regional center: USA 1-800-522-6752.
Canada 905-470-4425. United Kingdom 44-1753-676800. Singapore 65-482-0311. Japan 81-44-813-8502.
On the Internet at <http://www.amp.com>

AMP

Potential Cost Savings of Messaging

How to convince a CEO that a hub architecture is a good idea

- Legacy systems are transformed from albatrosses into long-term, flexible assets.
- The "language" of messaging is interpreted through business processes rather than computer protocols and technology jargon.
- The organizational pain of a typical systems replacement project goes away. Messaging can be done incrementally, with minimal impact on technology infrastructures and users. There are no big-bang messaging implementations.
- Upgrade decisions can be based on the business need rather than the vendor's release schedule.
- Messaging creates opportunities to reuse software interfaces and messages.
- Messaging creates a shift in costs rather than a new expense. Functions such as message transformation and flow control that already exist in the application program are shifted to messaging.

SOURCE: ROY SCHULTE, VICE PRESIDENT FOR THE SYSTEM SOFTWARE ARCHITECTURE SERVICE, GARTNER GROUP INC.

necting application A to application B through a message broker may not be any lower than that of directly connecting A to B," Schulte writes in a recent Gartner report, "Message Brokers: A Focused Approach to Application Integration." "However, if application A must then be connected to application

C, then the ability to reuse some of the work from the A-to-B connection is a clear payoff."

The potential ROI from a hub-and-spoke architecture also depends on the level of ambition of its architects. Basic messaging yields payoffs only in terms

more than half of all large enterprises will have some form of the architecture in place. Already, the concept has taken hold in the telecom and insurance industries and has an expanding presence in banking. Some companies, such as MCI Telecommunications Corp. of Arlington,

"THERE'S NO REASON to get rid of good legacy systems. If they're good, you'll want to re-create the business logic in the new systems. Why rebuild capabilities you've already developed?"

—Johan Vinckier

of reduced integration costs. But companies that use the architecture to build value-added processes (such as the automatic screen prompts in the above banking example) could see a difference on the bottom line—eventually (see "Potential Cost Savings of Messaging," Page 60).

The banking and health-care industries have already seen the payoff—they've been using variations of the hub-and-spoke system for as long as 20 years, according to Schulte. Those systems have gotten little exposure, however, because they are industry-specific and proprietary.

But the concept will work its way into the mainstream very soon because the business drivers for message brokers are already apparent. As companies buy or merge with others and begin to do more interenterprise computing, the pressure to integrate new applications with the old is increasing. Furthermore, as companies move away from custom-built applications and begin investing tens of millions of dollars in new, packaged applications, CEOs and CFOs will not be in the mood to throw away those applications any time soon. They will, however, want the flexibility to be able to use new, possibly incompatible technologies if they can add big business value.

Indeed, Gartner predicts that by 2001,

Va., for example, have created an organization dedicated exclusively to building business objects and managing integration of different systems (see "Proven Returns," Page 64). MCI is using its hub-and-spoke system to assemble "new" products that are nothing more than creative combinations of old products (and old legacy systems). "There's no reason to get rid of good legacy systems," says Vinckier, "because if they're good, you'll want to re-create [the business logic] in the new systems. Why rebuild capabilities you've already developed?"

In the long run, experts say, there's no reason the hub-and-spoke architecture won't still be functioning long after today's latest and greatest technologies have taken on the ugly "legacy" moniker. "That must become part and parcel of the IS organization," says Petty, "because we're talking about the essential business rules of the enterprise. It's like a meta application for all the applications in the company—it's how data is managed across those applications."

After all, adds Vinckier, "connectivity will have a longer life span than any of your applications." **CIO**

Senior Writer Christopher Koch can be reached at ckoch@cio.com.

The Integration Backlash

Part 3, "Proven Returns," profiles on message brokering, begins on Page 64.

“Getting all my

networks to work

together is like

trying to organize

a plate of

spaghetti.”



If you read the papers you know something's up at IBM Networking. There's been a drumbeat of new products. Whispers about technology alliances and more productive ties with key resellers. And bullish reviews of something called Switched Virtual Networking.

So, what's up? In a nutshell, we're ready to deliver here and now on the promise of network computing.

New products are the tools, and Switched Virtual Networking is the "owner's manual" that fits them to what you have and where you're going from here. And the logic behind the whole works is simple enough to fit inside 10 words: a network is more than the sum of its parts.

If it isn't, all you're buying is plumbing. That's where we come in. Much as we'd love to sell you every

new widget we've got on our shelf, it's the performance of the whole you're after – and what we want to be famous for. If you find better piece-parts, buy them. We're here to help you succeed in an interconnected world.

Which means helping you get more than the sum of the parts. (And more than the sum of the providers, too. Including us.) It's a role that IBM is equipped to play as no niche vendor can. Networking transcends individual



vendors the same way it transeends departments inside your shop, and eonneets you to businesses very different from yours. Making $1 + 1 = 3$ is what networking is all about. Heek, it's what business is all about: thriving on differencees.

Which is why we're doing all the things you've heard about and more. We'd love the ehance to show you (not tell you) more about what we've done and what we're prepared to do for you. Much of which is on vivid display at www.raleigh.ibm.com/netad or as near as your phone. 1 800 IBM-2468*, ext. DA003. In the meantime, we hope you'll think on our little mantra, "more than the sum of the parts." It's what you aim to make your business. And how IBM aims to make your networks work for you.

*It's not just what we've added that's new,
it's how we make it all work.*

*End-to-end Ethernet switching with any-to-any
connectivity. (And about time, too.)*

*Multiprotocol Switched Services seamlessly mesh
old and new networks. Best in show at N+I.*

*Who'd have thought IBM would be today's
fastest rising provider of low-end routers?*

Solutions for a small planet™



The Integration Backlash

PART 3

MESSAGE-BROKERING PROFILES

Proven Returns

MCI and Prudential are two early adopters of message brokering. Both have derived substantial business benefits—and cost savings—from that infrastructure.

BY CHRISTOPHER KOCH

To borrow some terminology from brokers of the investment persuasion, message brokers are a hedge against future uncertainty. They give businesses some degree of flexibility in dealing with the continual trading frenzy of new technologies, applications and computer platforms as well as the mercurial business forces that drive the frenzy—mergers, acquisitions, reengineering and the like. Message brokering connects a company's myriad applications and computing platforms together at a software "hub." The hub acts as a broker between the system, its various applications and the users. It also links dissimilar applications efficiently and creates a powerful opportunity to reuse those software links.

IS execs who have been doing that stuff for years have become evangelists for the approach. In 1986, MCI Telecommunications Corp. began working on a messaging architecture that has evolved into its Registry messaging system. Registry allows MCI to quickly mix and match different information systems to create new products in a matter of weeks. It also provides a sort of software liquidity, enabling MCI to absorb quickly the different systems from acquired companies as it struggles to diversify in the wake of telecom deregulation.

Prudential Corp. Australia Ltd. embraced messaging in 1994 as a hedge against vendor incompetence. Finding itself without a reliable packaged application to sweep away its balky legacy

The Integration Backlash

Both MCI and Prudential Corp. have gleaned extensive benefits from using a message brokering approach. It has allowed them to respond more flexibly to changes in the business climate as well as create products.

See **Part 2** of the series, "A Smarter Linking Logic," on Page 54, for a discussion of how message brokering works.

See **Part 1** of the series "Sounding the Alarm" at www.cio.com/CIO/111596_alarm.html for a look at the perils of integration.

You've had to
adapt, adjust, and change
direction overnight.

Mergers. Acquisitions. Reengineering. It's all part of doing business today. That's why the software you choose is important. Make sure it will help you adapt to change, not stand in your way.

Some software is not designed for change. Its rigid structure can't be adjusted easily. Then there's PeopleSoft. PeopleSoft believes change is not only inevitable, but can also be an opportunity. That's why PeopleSoft designed its software to accommodate change quickly and easily.

Only PeopleSoft offers PeopleTools. With these unique software tools, modifying or reorganizing is just a matter of pointing and clicking. Change is easy because PeopleTools

eliminate the need for detailed programming, armies of outside experts, or vast technical knowledge. All of which reduce your implementation and long-term maintenance costs.

And, unlike some software, PeopleSoft is portable, so you can change your database or hardware at any time.

If you believe in embracing change rather than avoiding it, perhaps PeopleSoft should be your software. You'll discover we have the technology, the people, and the commitment it takes to make that belief a reality. To find out more about PeopleSoft, give us a call at 800-947-7753 or visit us at www.peoplesoft.com.



Is it too much to ask the
same of your software?

Enterprise client/server software for finance, materials management, distribution, manufacturing, and human resources.

*A few of
the companies managing
change with PeopleSoft:*

BARNETT
BANKS

CANON COMPUTER
SYSTEMS, INC.

ELI LILLY AND
COMPANY

EQUITABLE
LIFE

HERSHEY FOODS
CORPORATION

SONY
MUSIC

WHIRLPOOL
CORPORATION

The Integration Backlash

PART 3 MESSAGE-BROKERING PROFILES

systems in its life insurance division, Prudential decided to use messaging as a way to achieve better returns from those legacy systems.

CIO recently talked with some early messaging investors. **Vincent P. Clements** is the director of customer information systems at MCI's Network MCI Services division in Washington. Clements has been involved with MCI's messaging efforts from the start in various roles, beginning as a programmer, and he now oversees Registry. **Clint Petty**, president of Reston, Va.-based DCMS Inc., developed the architecture and design for Registry and managed its implementation. His consulting firm helps companies build the necessary middleware infrastructure to support a hub-and-spoke architecture. **Anthony Targett**, technical



Vincent P. Clements, director of customer information systems at MCI's Network

services manager at Prudential Corp. Australia, helped develop the messaging architecture using IBM's FlowMark/AIF documentation and now manages the messaging environment. These three pioneers share how the architecture works at their companies and what benefits it might offer to other CIOs.

CIO: What was MCI's motivation for trying the messaging approach?

Clements: The challenges of the telecom industry have intensified, especially with the passing of the 1996 Telecommunications Act. Two years ago, our competitors were AT&T and Sprint Corp.; now competitors are popping up every day—whether they are new telecom, wireless or cable

companies or the regional Bell operating companies [RBOCs]. Because of the intense competition, we're trying to find new markets and products and services to build for the future. There's no way you can rely on long distance alone anymore.

Registry gives MCI the opportunity to quickly tap into partnerships with other companies that we can leverage to perhaps enter a new business. Most of our products revolve around information of different types and sources. Registry lets us bring together that information more quickly.

CIO: What drove Prudential's move to messaging?

Targett: We'd been looking for a packaged application that could serve the needs of our life insurance division for six years, to no avail. Our legacy application was already obsolete. Our reps had to search through as many as 10 different systems to find customers' various insurance policies. We thought about integrating our legacy application with a package to get the functionality lacking in the package alone but quickly realized that it would result in another inflexible system.

We have a heavily regulated insurance system here in Australia, and each time a change is made in the rules—which is quite frequently—we have to reflect those changes in our computer systems. That became very complex and difficult to do. We decided we had to have a foundation messaging system that would enable us to change our legacy application quickly and add others if necessary.

CIO: Because overhauling computer infrastructure isn't a flashy project with obvious business value, it generally gets little attention from executives. Has messaging had any direct impact on your businesses, or does it simply make IS's job a little easier?

Clements: Competitive advantage in telecom comes from being able to assemble new products quickly—either in-house, through acquisition or through alliances. As good as the marketers are at coming up with new products, the [IS] organization then has the pressure on them to deliver as

quickly as possible.

Our new service, MCI One, is a good example of how we use Registry to speed new products to market. MCI One is our bundled service that offers long distance, local pager, cellular, personal 800 and Internet access all on one



Anthony Targett, technical services manager at Prudential Corp. Australia

invoice. Not all of MCI One was native new development; some of it was just interfacing with legacy applications. With Registry, we were able to assemble all those pieces together in a matter of weeks as opposed to months or even years using the traditional methods of integration. Plus, it gives us the flexibility to add more services later without touching what's already there.

Petty: Creating the messaging system and setting up standard interfaces into existing application functions means MCI has a tremendous reuse opportunity. MCI One was created from existing building blocks that were already being used for product delivery at a more granular level. By doing the work upfront to establish the messaging system and the standard interfaces into existing application functions, we can now take very vanilla services like 800 or Internet access that by themselves are common and create something that is uncommon simply by creative combination of existing components and good marketing.

Targett: At Prudential, we have dramatically increased the productivity of our customer service people. Our reps used to do manual searches for policies while the customer waited on

CLAIMING PART OF THE INTERNET FOR YOUR PRIVATE USE IS ANTISOCIAL. IT'S ALSO GOOD BUSINESS



Introducing **INTRANETS** from networkMCI Enterprise Management.SM

A customized Intranet lets offices throughout the country and the world share important information quickly and efficiently. It does away with time-consuming searches by putting relevant and tailored information at your fingertips. And it allows your employees to work more productively.

All with complete privacy and security.

We can seamlessly integrate an Intranet into a state-of-the-art information system. An information system our networkMCI Enterprise Management specialists can design, build and maintain for you.

For more information, call your local networkMCI representative at 1-800-338-6815 or log on at <http://www.mcisystemhouse.com>. Even if your company isn't a giant of industry, the very same experts who serve our *Fortune 500*[®] customers will go to work for you.

And in short order you will discover that an Intranet is more than a high-tech curiosity. It's also the most efficient way to conduct day-to-day business.



Real benefits from converging technologiesSM

© 1996 MCI. All rights reserved.

The Integration Backlash

PART 3 MESSAGE BROKERING PROFILES

the phone. As the information came up, the reps wrote it down on paper and moved on to the next search. Calls lasted about five minutes on average. With the new system, the reps execute a single search, which has brought down the average call time to about 20 seconds.

CIO: How much effort is required from IS to support messaging?

Clements: Back in 1993, we started with four people from IBM. By the end of 1996, we will have about 50 people. The development team has grown over the years, but the major growth has been on the support side.

In 1995, we went from supporting several applications to 95 different applications. Without Registry, each of those 95 applications would need at least one person supporting them. By the end of 1997, we expect we'll be serving 150 different applications. We're seeing 30 million messages a week. Our customer service division alone uses 16 different applications all tied together with Registry across 11 different customer service centers in the United States—and that's just residential customer service.

CIO: What have been the biggest paybacks from messaging so far?

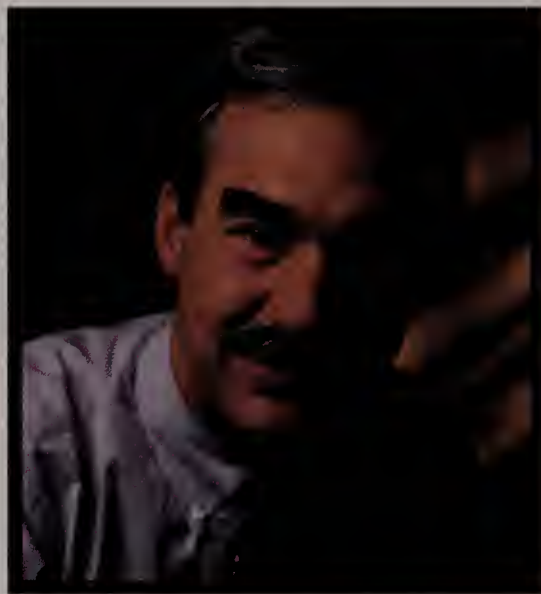
Petty: The biggest benefit at MCI is that there's very little duplication of integration effort. Now that we have developed the messaging and business logic within Registry, there's no need for the various application development organizations across MCI to worry about integration or communications issues. That's handled centrally by us, so they are free to focus on application development.

The heavy-hitter cost savings comes from the reuse of Registry's various messages. We've already figured out how to get at the data, so when one of the development organizations wants to build a new application using the same basic business logic that's contained within Registry, they don't even *have* a development cycle. All they need to do is design the front-end application and GUI and reuse the messages in Registry to access the data.

The development organizations can bring up new applications in a matter of

hours now. Say, for example, somebody needs to display customer data in a different way. He doesn't need to worry about how to get at the data he needs; all he has to worry about is putting together the screen that the user sees.

Targett: The building-block nature of [Prudential's system] has already given us quite a bit of reuse. We're implementing an image and workflow system that's Unix-based [the company's messaging system is mainframe-based], and we've had to develop 10



Clint Petty, president of Reston, Va.-based DCMS Inc.

new [messages]. But there's only been 20 percent new coding work because the back-end agents that we already developed could be used again.

CIO: What were the most difficult barriers to acceptance of messaging in your organizations?

Clements: It's been very difficult getting all the different development organizations within MCI to agree on a standard. We have some deep, deep battle scars, and it's been a long and tough road of salesmanship trying to get the Registry embraced. There are still some parts of MCI that think they have a better solution. But I think we've made significant progress in the last year toward working things out. About 85 percent of MCI now uses Registry as the standard.

Petty: If you think about trying to get a company like MCI to agree on a standard way to develop applications or integrate them, you quickly realize that it can't be done. Instead, we've

said let's agree on the communications layer and let everyone develop applications however they want. MCI's organizational discipline to make a single decision at that [communications] layer is what has made Registry successful. It hasn't been easy, because everyone thinks they're the savviest technology organization and they think their views of communications technology should be used across the company.

Targett: The disadvantage of the messaging architecture is that all of our developers at Prudential are used to working in a synchronous mindset. They're used to developing systems that talk to one another in a real-time, request-reply style. Messaging is asynchronous, and it can be difficult for people to conceptualize.

For example, if a customer rep requests client policy details, a message is sent and it may not come back for 10 minutes [while it searches the various places where data is hiding]. That user may get tired of waiting and shut off the PC and go home. That data will be lost because we didn't design the system to pick up messages that were sent the previous day. We are working harder in this area, but it's been difficult to change the way developers think about designing applications.

CIO: Not many companies are doing messaging today. What kind of advice would you offer to those considering it?

Clements: I would encourage everyone to go down the same path we have because even if you think you're in a monopoly setting one day, the next day you may find yourself playing catch-up with someone you've never heard of before. I think it's a very worthy investment to position yourself for the kind of intense competition that every industry faces eventually. It just so happens that telecom is probably one of the fiercest right now, but it's hard to find any type of business that doesn't have this kind of competition happening at least on an incremental basis. **CIO**

Senior Writer Christopher Koch can be reached at ckoch@cio.com.

NT NT



AViiON

In the enterprise:

AViiON servers make Windows NT Server a true enterprise platform.

Built on decades of enterprise experience, Data General's AViiON® servers provide high reliability and comprehensive high availability features that set AViiON apart from other NT servers. Enterprise features like: ■ CPU and memory deconfiguration ■ N+1 power and cooling ■ 8-way SMP ■ Data integrity with CLARiiON storage ■ Multi-path I/O for protection against loss of a controller ■ Clustering capability for protection against loss of a server and ■ NTAAlert--the industry's only NT-based remote service for early identification of potential problems. That's why the AV 4900 was recently awarded a *PC Week Labs Analyst's Choice* award.*

AViiON servers are running enterprise NT applications like SAP, PeopleSoft, and Oracle Financials worldwide. They are ready to run your NT applications today. And if you are running UNIX applications, AViiON servers are still the way to go - same outstanding hardware design; same enterprise features; same service, support and integration from Data General.

 **Data General**

1-800-DATA GEN
www.dg.com

*PC WEEK June 17, 1996

remodeling **SEARS**

The country's third-largest retailer is back with new blood at the top and a whole new way of looking at IS

BY DANIEL GROSS

When Arthur Martinez, the chief executive officer of Sears, Roebuck and Co., enters his corner office on the sixth floor of the company's Hoffman Estates, Ill., complex, the head of the nation's third-largest retail organization does something rather prosaic. He turns on his computer.

"Before I get my coffee," he notes.

Reader ROI

INFORMATION SYSTEMS was not contributing to Sears, Roebuck and Co.'s strategic success until it was remade into a turnaround tool.

This article explains how to restore retail luster by:

- ▶ Aligning IS with the company's new strategic goals
- ▶ Reducing IS spending to industry-average levels
- ▶ Delivering innovative systems to merchandisers



CEO Arthur Martinez led Sears' turnaround.

In an age when many middle-aged CEOs are still unabashed technophobes, Martinez openly embraces computers and appreciates the power of IS. And at Sears, Martinez needs all the power he can get. Martinez left Saks Fifth Avenue in New York to take the helm of Sears' flagship merchandising division in 1992, just as the company was racking up a \$1.7 billion loss. A decade of diversification into areas such as insurance, real

estate and securities had torn Sears from its core business: retail sales. The next year, Sears moved its headquarters from the landmark Sears Tower in downtown Chicago to a sprawling glass complex 40 miles northwest of the city. The move was part of the company's struggle to reposition itself, an effort that Martinez, who replaced Edward Brennan as CEO in 1995, now leads. A

big part of his strategy, Martinez says, relies on IS improvements.

"When I came here, I saw an IS organization that wasn't contributing to the strategic success of the business," says Martinez. "There was no overarching view of how technology could play a strategic role in our business."

PHOTO COURTESY OF SEARS, ROEBUCK AND CO.

TURNAROUNDS

Ted Grossman, professor of information systems at Babson College in Wellesley, Mass., and a retail consultant, agrees with Martinez's assessment. "They were starchy, old-line conservative, mainframe-driven," says Grossman. "They were really in a trailing-edge mode. I think they have leapfrogged many of the other companies."

Martinez's main goal, to refocus the company on retailing and reconnect with a vast (and largely female) customer base, is now within reach. In the last three years, Sears has lowered its margins and increased same-store sales at more than twice the rate of the Merrill Lynch Broadline Retailers Index. IS, Martinez says, contributed to the change: In two years, the division cut spending by nearly \$100 million and put in place strategic, efficient systems that provided more information more frequently to buyers and merchandisers.

But getting there hasn't been easy. Martinez started by hiring outside help: Price Waterhouse, which in 1992 dispatched a low-key analyst named Joseph

Smialowski to do a comprehensive audit of Sears' IS operations. A graduate of Merrimack College in Andover, Mass., and the Rochester Institute of Technology in New York, Smialowski had spent several years at Xerox in information systems before joining Price Waterhouse in 1982. He had also worked on other similar projects for both Saks and Sears.

"There were three critical issues that came out of the report card,"

says Smialowski. "While there were a lot of positive aspects to the organization, the shortcomings were that the cost structure in IS was simply out of line when you compared it against other retailers. Second, in spite of the fairly significant expenses the company was incurring, application capabilities were not comparable to what most retailers had. The third was that the organization was not an effective organization."

Smialowski made recommendations on 15 key projects and divided them

into three tiers: those necessary to reduce costs, those necessary for strategic purposes and those that could be used to competitive advantage. He also outlined a broader goal: to integrate IS more fully into the company's overall business strategy. To do that, Smialowski advised, Sears would have to bring a greater sense of organizational purpose to the IS department. It would have to upgrade the skill levels of

"What we needed in the job was some real perspective in what best practices were like."

—Arthur Martinez

Going Up

An elevated CIO position brings new credibility to the department

LAST APRIL, AS A SIGN of the importance IS has attained within the company, CIO Joseph Smialowski was elevated to Sears, Roebuck and Co.'s 14-member executive committee. Now, instead of reporting to the CFO, Smialowski reports directly to CEO Arthur Martinez. "It was important that Joe have a seat at the table so that he could be a partner in the strategies that were being developed," says Martinez. "It isn't just a one-way conversation. It symbolizes the real importance of IT in a company as large and complex as this."

Smialowski is one of several new faces around the table. Nine of the 14 members of the committee, which essentially runs the company, have joined Sears since Martinez's arrival. Among them is William Pagonis, who headed the U.S. Army's logistics effort in Desert Storm and now runs Sears' logistics department.

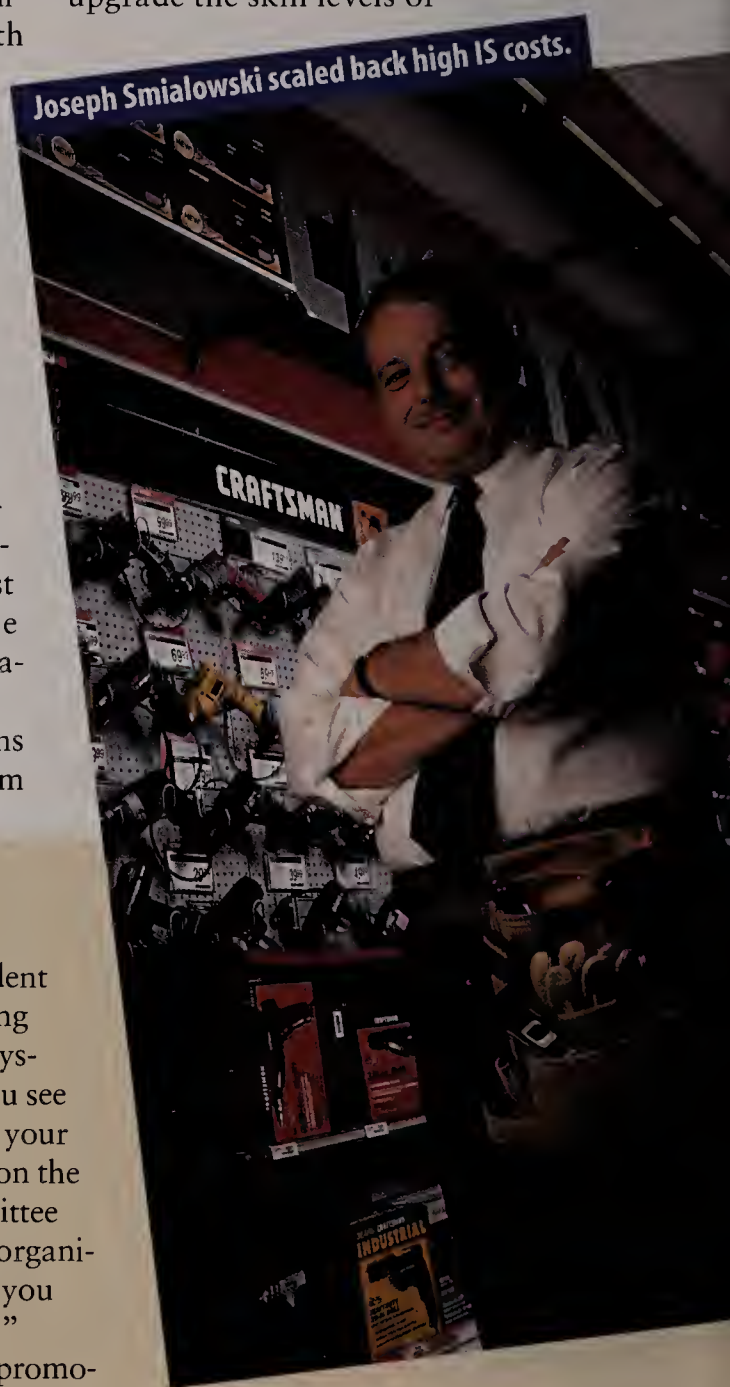
IS veterans see a great deal of symbolism in Smialowski's ascent. "Joe's promotion to the executive committee was a lightning bolt to me personally about the importance of my

job," says Steve Junk, vice president for merchandising and marketing systems. "When you see the man leading your function sitting on the executive committee of a \$35 billion organization, it makes you feel pretty good."

Smialowski's promotion has changed the perception of the CIO's job in particular and of the IS department in general. "I think it's an avenue to a senior position that wasn't available before," says Smialowski. "And this avenue really stresses the importance of being well-grounded in business and leadership skills as well as technology."

Smialowski believes his experience is likely to become more common. In an era when companies increasingly adopt standard information packages from outside vendors, CIOs must possess a new set of skills. "You're spending much less time building and much more time dealing with strategy and planning," he says.

—D. Gross



IS specialists so they could interact with their merchandising counterparts in a more meaningful way, and it would have to enlist non-IS professionals to help design new applications.

"It was abundantly clear that we had nobody in the organization remotely capable of taking it on," says Martinez. "What we needed in the job was some real perspective in what best practices were like."

Martinez liked the message so much that he hired the messenger. Sears executives approached Smialowski during the spring and summer of 1993, and he came on board as CIO that August.

These days, when Arthur Martinez turns on his computer each morning he logs into SPRS, Sears' new Strategic Performance Reporting System. SPRS lets authorized Sears employees look up any sales figure—by store, by area, by item, right down to the size and color of a flannel shirt. With a few clicks of a mouse, a buyer can slice and dice the data, comparing current performance with that of the previous week or the previous year.

As recently as a year and a half ago, buyers at Sears flew blindly, lacking quick, reliable information on who was buying what at which store. They could see nothing more specific than each division's daily performance. Today they can look up how many air conditioners are sold in the Grand Rapids, Mich., store on any given day and they can punch up a weather forecasting service that will help determine how many air conditioners might be sold tomorrow. And most of the data available can be displayed various ways, such as in pie charts or graphs.

It was the development of SPRS, more than anything, that signaled the move of Sears' IS department from a support role to a leadership role. In constructing the SPRS team, Smialowski enlisted senior merchandising executives full time. Starting in the spring of 1994, a group of business users and IS staffers met every Tuesday at 7 a.m. to discuss the shape of the new system. "We designed the format and communicated the business needs," says Jonathan Rand, mer-

chandise director for apparel and home fashions, who had no previous technical background.

Today, Sears IS professionals are sprinkled throughout the organization. Each major business line has its own IS executive. The IS head in the credit area is Ken DeWitt, former CIO at Saks. Carver Johnson, the former CIO at Jamesway Transportation Co. in Denver, is the IS executive for finance and administration.

Such high-powered hires, all of whom report to Smialowski, were necessary because the Sears computing environment is still complex. The company makes extensive use of data warehousing and is in the process of shifting from the NCR Teradata infrastructure to a new

architecture designed by Informix and IBM Corp. Within the massive headquarters complex, a client/server system links nearly 5,000 desktop computers. In addition, every store has a server feeding into the data warehouse. Much of the equipment is less than two years old.

"Sears isn't a mainframe shop," Smialowski says. "We're a large-scale computing environment that takes advantage of all the elements that are out there."

Fortunately, some of those elements were put in place before Smialowski's arrival. In 1991, for example, two years before he signed on, Sears commissioned CompuAdd Computer Corp. to build 28,000 new computerized cash

The Future is in the Cards

Sears marketers mine charge card data from a new warehouse

WITH 32.5 MILLION ACCOUNTS, the 85-year-old SearsCharge card is the fourth-largest credit card operation in the country. But though the cards are used to charge about \$24 billion in sales each year and account for more than 60 percent of Sears, Roebuck and Co.'s sales, the credit card division generally has been regarded as a service product, a convenience to customers. "Retailers have always looked at it from this perspective: If you advertise it, they will come," says John Delany, vice president of credit marketing.

Delany, who joined Sears in 1994 from the Bank of New York, is using technology to target customers, much as credit card operations have been doing for years. By doing so, Sears gains a huge competitive advantage. If a customer buys a product at Sears with a Visa card, Visa simply will learn that a product was bought at Sears. When customers use the Sears card,

Sears knows whether the product was an automobile battery, a woman's suit or a set of golf clubs. As Smialowski puts it, "very few companies have the same level of customer information as Sears."

Armed with such data, Delany is trying to turn Sears into a sophisticated database marketer. With a new data warehouse built on a platform by Informix Software and IBM Corp., Sears manipulates the data it collects. After segmenting the customer base—tracking those who use the revolving credit option, for example—the next step

is offering pitches for specific products to the customers most likely to buy them. For example, somebody calling with a change of address would receive promotional material on home products. "This sort of thing is not standard in the retail industry but is in the credit card business," says Delany. "It's a fundamentally different kind of marketing."

—D. Gross



registers to its specifications.

The registers, which eliminated dozens of transaction codes and provided information such as the status of orders and the availability of a products, cut training time from four hours to 45 minutes and allowed associates to order out-of-stock goods directly from a store floor.

It was a good start, but Smialowski knew much more had to be done. Sears is, after all, far more than a chain of 800-plus stores. It is also the fourth-largest issuer of credit cards in the country as well as a gigantic home-service company. And each division has its own technological needs (see sidebars). To meet the challenges, the IS department decentralized in the late 1980s and placed key staff members in business units.

That was both good news and bad. "Though we were getting closer to the business, we were not operating in a very effective way," says Stephanie S. Springs, senior systems director with the corporatewide IS management unit. "We did not have standard policies on how we were managing our assets."

For example, each unit at Sears bought its own computers, a policy that diminished the company's buying clout. The decentralization helped account for the IS department's bloated costs. In 1993, Sears spent about 1.6 percent of sales on IS, far above the retail industry benchmark of 1.2 percent. And while that difference may not seem like much, it adds up quickly in a \$30 billion company.

Smialowski confronted costs on several fronts, but his greatest coup was the renegotiation of a 10-year outsourcing contract with Advantis, the joint venture of Sears and IBM that managed data processing and data communications. That contract alone accounted for about 70 percent of the budget. "We asked them to take \$20 million out of their costs," says Smialowski, who now sits on the board of Advantis. "And they did."

Next was the head count. In August 1993, roughly 1,400 people reported to

the CIO. Sixty percent of them were Sears employees; the rest were contract labor. Sears skewed that mix even more in favor of in-house talent. After all, "once the project was completed, the expertise went out the window," Smialowski says. Today, 90 percent of the 1,000 IS staffers are Sears associates, and the company has renegotiated the rate structure for its consultants. "You have some advantage when you understand the underlying economics of the consulting business," the former consultant says.

The cost-cutting paid off. The IS department has reduced its annual spending by about \$100 million and its budget has fallen to 1.2 percent of total revenues (right on the industry's target). Overall, Sears has reduced its sales and general and administrative costs from 22.7 percent of sales in the 1992 fourth quarter to 21.3 percent in the 1996 second quarter.

But the second goal—aligning the IS department with the company's emerging strategic goals—proved more difficult. Unlike budget slashing, it required a cultural transformation. Although IS staffers worked in the business lines, there was a significant language barrier between the technology specialists and the merchants. "I don't think there was any real synergy among all of us," says Mark Manock, merchandise information director for Sears home businesses, which comprises all retail products other than clothing. "I quite honestly didn't have any perspective on what the

projects were, where they were, how they were being funded."

Steve Junk, vice president for merchandising and marketing systems, puts it plainly: "The IS function in most areas was considered very much a support organization."

Home Improvements

Sears rings up millions with service call scheduling system

ALTHOUGH SEARS, ROEBUCK AND CO. is primarily a retailer, it does more than run large stores: Its Home Services business brings in \$3 billion in annual revenues. As the nation's largest house-call outfit, its 14,000 technicians conduct about 17 million home visits a year to make repairs.

Before 1993, customers would call local repair centers during regular business hours to schedule service calls. At each of the 650 or so locations, representatives would have to look up the service information on hard copy, then schedule visits.

That's changed. First, Sears transferred the information—when a customer bought a product, the product's repair history, etc.—into a database. Then it set up a 24-hour toll-free number and consolidated service representatives in five central locations. Those centers pass the calls on to 92 regional offices, where computer-aided routers direct service calls. The technicians use handheld wireless computers to exchange information with appropriate databases during the service call.

That system has saved Sears tens of millions of dollars and, the company says, has improved service. "We have focused on the productivity of the technicians as well as improving our ability to complete the call the first time," says CIO Joseph Smialowski.

—D. Gross

SEARS' VITAL STATISTICS

1995 revenues:

\$34.9 billion

Employees:

320,000

Stores:

2,600

1995 IS spending:

\$400 million

The Internet is now safe for more than window-shopping.



Working with EDS, First Virtual is making the Internet a safe place to use a credit card.

One day, a man named Lee Stein came to EDS with a vision.

He believed that he had figured out a secure way for people to use plastic over the Internet. It involved assigning VirtualPINTM numbers to account holders who could then place orders with merchants worldwide.

A nice vision. But it took a CoSourcingSM relationship with EDS to make it a reality. We figured out a practical way to cross-check PIN numbers with credit card numbers, then designed

a confirmation process that made the whole system bulletproof.

Today, with EDS securely processing the transactions for customers in 162 countries, Lee's new company, First Virtual, is doing well. Transactions: 1,000,000. Cases of fraud: 0.

To learn how an EDS CoSourcing relationship can benefit your company, contact us at 1-800-566-9337 or at info@eds.com.

Or visit us at <http://www.eds.com>.

► **A more productive way of working**



CIO

P E R S P E C T I V E S

Corporate Hosts

ACXIOM

CENTURA
SOFTWARE CORPORATION
formerly known as GUPTA

CISCO
SYSTEMS

COMPUTER
ASSOCIATES
Software superior by design.

Data General

DELL

ERNST & YOUNG LLP

hp HEWLETT
PACKARD

Hyperion
software

IBM

INFORMIX

intel

LBMS

LOCKHEED MARTIN

SEQUENT
Big, Open Systems That Work

Sun
microsystems
THE NETWORK IS THE COMPUTER™

TEXAS
INSTRUMENTS

TEL

March 23-26, 1997
Sheraton San Diego Hotel & Marina
San Diego, California

Leading the Charge in Turbulent Environments IT as a Change Agent

Featured Presenters

Warren Bennis • Peter Drucker • Jack Trout

Conference Preview

Leading the Charge in Turbulent Environments *IT as a Change Agent*

March 23-26, 1997 • Sheraton San Diego Hotel & Marina • San Diego, California



Featured Presenters

Warren Bennis
Peter Drucker
Jack Trout

Plus

Conference Moderator:

**James C.
Wetherbe, PhD**



CIO PerspectivesSM Conference

Leading the Charge in Turbulent Environments: IT as a Change Agent

March 23-26, 1997 • Sheraton San Diego Hotel & Marina • San Diego, California

When Decartes said "the more things change, the more they stay the same," he had never tried life as a CIO. As corporations continue to reinvent themselves to be more efficient, flexible enterprises to compete in today's marketplace, we will find IT at the hub of these strategic changes. More than ever, companies regard IT as a global strategic tool: but are CIOs the right leaders to effect these changes? Although IT is the driving force behind much corporate change, really making change work means something far greater. IT executives must examine the difference between leading and managing strategic change. From managing the CEO's expectations to defusing resistance to new technical projects, a change agent does far more than decide on the new architecture for the company.

The latest in our *CIO Perspectives* Series, **Leading the Charge in Turbulent Environments: IT as a Change Agent**, is designed to address the multiple drivers and aspects in the change process including technological innovation, "right sizing" and

economic influencers as well as the human factors such as leadership dynamics, communication challenges, behavioral impact and implementation.

"CIO Perspectives is an excellent place to meet the key decision makers shaping IT usage — a powerful opportunity to network outside your industry."

Douglas Nies
Vice President
Information Services, ServiceMaster, Inc.

Our keynote session will feature a dialog between **Peter Drucker**, the world's most noted authority on corporate management, and **Warren Bennis**, Founding Chairman of the Leadership Institute and world renowned leadership authority. **Jim Wetherbe**

will return as the conference moderator, and **Jack Trout**, marketing guru, will discuss the most important "mental" elements in the positioning process, as well as dealing with the twin realities of change.

To participate in **Leading the Charge in Turbulent Environments**, visit our Web site at <http://www.cio.com> or complete the enrollment form on the back of this brochure and fax it to us at 508-879-7720. You may also call our conference hotline at 800-366-0246. Join your colleagues and peers for 1997's most important conference on change.

Concurrent Sessions:

In addition to our general sessions, a series of concurrent sessions will be provided on Monday and Tuesday by our corporate hosts. You may choose up to six of these sessions to attend.

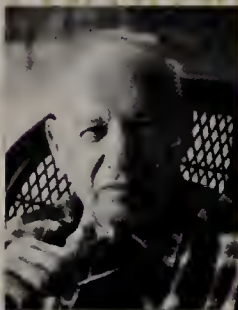
Companion Program:

Participation in the companion program includes all scheduled meals, receptions, entertainment, a stretch and tone class, and a scenic tour of San Diego by Land and Sea.

Featured Presenters



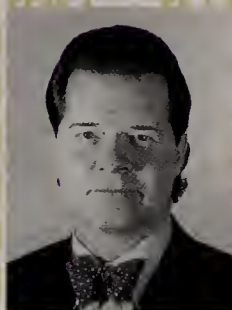
Warren
Bennis



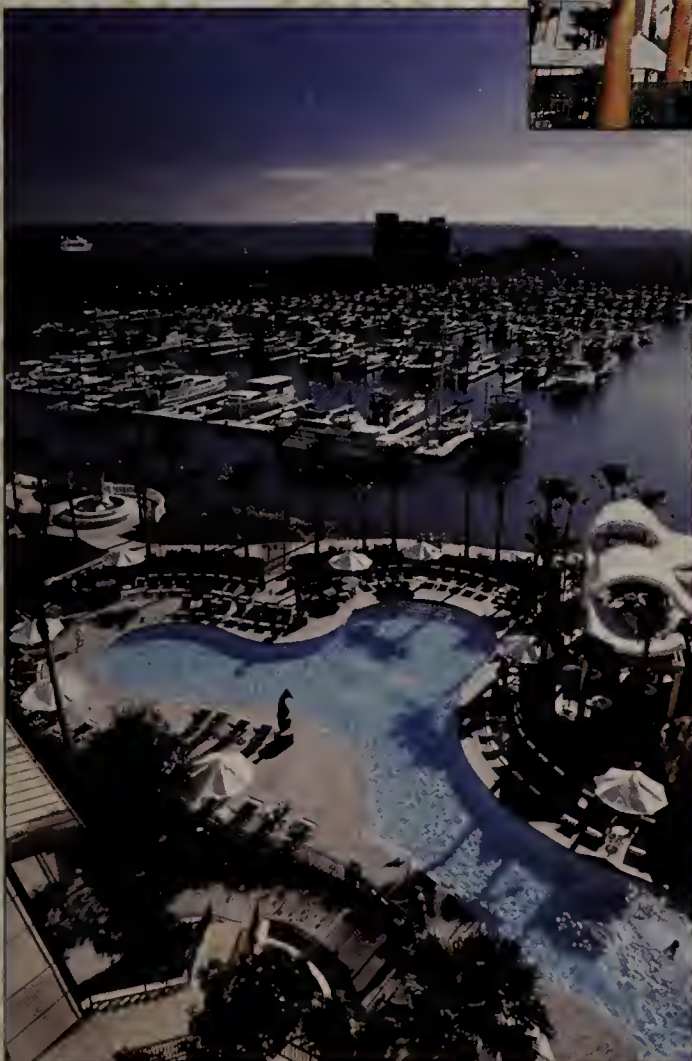
Peter
Drucker



Jack Trout



Moderator
Jim Wetherbe



Corporate Hosts

ACXION

CENTURA
SOFTWARE CORPORATION
formerly known as GUPTA



COMPUTER ASSOCIATES
Software superior by design.

Data General

DELL

ERNST & YOUNG LLP

hp HEWLETT PACKARD

Hyperion
SOFTWARE

IBM

INFORMIX

intel

LBMS

LOCKHEED MARTIN

SEQUENT
Big Open Systems That Work

Sun
microsystems

THE NETWORK IS THE COMPUTER™

TEXAS INSTRUMENTS

TEL

ENROLLMENT FORM



Leading the Charge in Turbulent Environments: IT as a Change Agent

March 23-26, 1997 • Sheraton San Diego Hotel & Marina • San Diego, CA

Please visit our **Web site** at <http://www.cio.com> or **Fax** to 508-879-7720. You can also **Call** us at 800-366-0246 or **Mail** completed form to: Executive Programs, CIO Communications, Inc., 492 Old Connecticut Path, Framingham, MA 01701.

NAME		
TITLE		
COMPANY		
ADDRESS		MAIL STOP
CITY	STATE	ZIP CODE
PHONE	FAX	
E-MAIL		COMPANY WEB SITE ADDRESS
WHAT IS YOUR INDUSTRY?		
YOUR NAME AS YOU WANT IT TO APPEAR ON YOUR BADGE		
HOTEL ARRIVAL DATE		HOTEL DEPARTURE DATE
NAME OF COMPANION (IF PARTICIPATING IN COMPANION PROGRAM)		TID1

CHECK ALL THAT APPLY:

ENROLLMENT FEE

- ☐ **IS Practitioners/Executives**
If you are a CIO, IS executive or hold another executive position, the fee is **\$1,595**.
- ☐ **Government/Military**
The fee, which includes your hotel for three nights, is **\$1,993**. *Do not make your own hotel reservations. CIO will make them for you.*
- ☐ **Sales/Marketing/Consulting**
If you hold a sales, marketing, new business development or consulting position, the enrollment fee is **\$5,000**. CIO will make the final determination of this category.

OTHER ACTIVITIES

- ☐ **COMPANION PROGRAM (\$275)**
Companions must be enrolled in this program to attend any conference-related functions. Includes all scheduled meals, receptions, entertainment, companion breakfast, stretch and tone class, and a scenic San Diego by Land and Sea Tour. Conference session attendance not included.
- ☐ **I will not be staying at the Sheraton San Diego Hotel & Marina**

Name of alternate hotel

PAYMENT INFORMATION (Please make checks payable to CIO Communications, Inc.)

- ☐ Check enclosed ☐ Bill company (A purchase order # must be submitted)
- ☐ P.O. # _____
- ☐ Credit card # _____
- ☐ AMEX ☐ VISA ☐ MC Exp. _____
- Signature: _____

TO ENROLL CALL 800-366-0246, visit our WEB SITE at <http://www.cio.com> or FAX us at 508-879-7720.

Please
Attach
Business
Card Here

ATTIRE

Casual! Please, no suits, ties or business attire!



HOTEL ACCOMMODATIONS

A block of rooms has been reserved at the Sheraton San Diego Hotel & Marina. We urge you to make your reservations early by calling the hotel at 619-692-2265. Be sure to identify yourself as part of the CIO conference to receive the conference rate. Please make your reservations early and guarantee your room with a credit card, as all unreserved or unguaranteed rooms will be released on 2/23/97. Hotel reservations/cancellations and charges are your responsibility. CIO will make hotel reservations for government/military participants.

TRANSPORTATION

American Airlines is the official conference carrier. Call American at 800-433-1790 and reference Star File #S1237MA. AVIS is the official car rental provider. Call AVIS at 800-331-1600 and reference B766657.

ENROLLMENT FEES

All enrollment fees must be paid in advance of the meeting. Fee includes conference sessions, concurrent sessions, corporate host displays, conference materials and scheduled meals. Transportation, hotel and recreation are your responsibility.

CANCELLATION

You may cancel your enrollment up to 3/7/97 without penalty. No refund or credit will be given for cancellations received on or after 3/7/97. You may send a substitute in your place.

CIO reserves the right to decline enrollment to any registrant.

By developing applications in conjunction with merchandising executives, Smialowski's IS team began relating to the rest of the company in more understanding ways. Similarly, when buyers realized how much SPRS and other IS innovations could improve their performance, they came to appreciate the techies. IS emerged in a new, central role.

"The systems world in our company is really the glue that holds the company together," says CEO Martinez. "Joe represents that glue in many respects."

While Smialowski was busy bonding, Sears was busy disengaging, continuing the divestiture of non-core operations such as Allstate Insurance and Coldwell Banker Real Estate that began four years ago. Martinez became chairman and CEO of the newly streamlined Sears after the Allstate divestiture.

With SPRS up and running, Smialowski's agenda shifted to the Internet. The company is setting up a Web site this fall, which it will use for electronic sales and to promote specific categories

SEARS' COMEBACK				
	1992	1993	1994	1995
Revenues	\$32.9b	\$30.0b	\$33.0b	\$34.9b
Expenses as a percentage of revenues	96.4%	92.9%	92.7%	91.2%
IS spending as a percentage of revenues	>1.6%	1.6%	1.3%	<1.2%

of goods. Sears hopes to use Internet-related technology, Smialowski says, "to extend the Sears enterprise to encompass suppliers." A system that will let suppliers check on the status of an invoice is in the works, for example. The company also plans to give vendors access to SPRS so that they can check sales of their products and do just-in-time inventory.

By all accounts, the IS crew has to work hard under Smialowski. His family still lives in Connecticut, which allows him to focus completely on the job. The level of

effort is required because Sears management views the turnaround as a process, not a discrete event. Smialowski agrees. "We need to work on how we use technology to sustain the transformation and turnaround over the long term," he says. "And we need to do it in such a way that it preempts competitors." **CIO**

Daniel Gross is the author of Forbes Greatest Business Stories of All Time and can be reached via e-mail at dangross@panix.com.

Ready to distribute software and documents over a Web network? Think again.

With MEGASOFT Web Transporter™, it's safe to send software, reports, news, important documents and updates over the Internet and intranets. It's the only client/server, web technology to make online distribution both secure and simple. Users simply point and click to pull down files. Automatically downloads and installs your files to internal desktops and remote users. Authenticates users and groups. Manages versions. Tracks licenses. And confirms successful delivery.

MEGASOFT Web Transporter. Simple. Fast. Powerful. It'll slash your costs, simplify distribution and protect your valuable files. Don't deliver over a Web network without it.



© 1996 MEGASOFT Online, Inc.



For details and a copy of our white paper on Web-based fileset distribution, call **1-800-MEGASOFT (634-2763)** today. And visit us at <http://www.megasoft.com>.



AUTOMATIC STANDARDS

BY JENNIFER BRESNAHAN

Suppliers to the Big Three automakers are being forced to comply with mandatory quality standards. Their plight could foreshadow what lies ahead for other industries.

PICTURE IF YOU WILL the quiet town of Bardville, located somewhere in the heart of auto country. Its streets are dusty and forlorn. The windows of the houses along Main Street have been boarded shut since the good people of Bardville left in search of jobs. And the Bard Automotive plant, once the bustling mainstay of the town, is now empty, save for a family of squirrels living in a ventilation shaft. Bardville lost its luster when Bard Automotive shut down in 1998 after repeatedly failing to meet the Big Three's QS 9000 certification requirements. Without the business of Ford Motor Co., General Motors Corp. and Chrysler Corp., Bard Automotive simply couldn't survive, nor could the town.

Reader ROI

BY NEXT SUMMER, suppliers to the auto industry must meet QS 9000 quality standards if they want to do business with the Big Three. For CIOs weighing the value of standards compliance, auto suppliers' experiences will help them understand:

- ▶ Costs of compliance
- ▶ Pitfalls of the certification process
- ▶ Business benefits of meeting quality standards
- ▶ How to leverage standards to advance IS goals

May we be straight with you? Good. Because there is no better way to buy your company's PCs than straight from Dell.

We manufacture every OptiPlex desktop precisely to your order. Equipped the way you want it, configured the way you want it, with all the drivers and software pre-

installed. No struggling to make off-the-rack systems work on your network. You plug, you play, you go have lunch.

Since we build them so well, we feel a powerful commitment to support them well, too. After all, who better to look after your machine than the company

that designed it from the ground up?

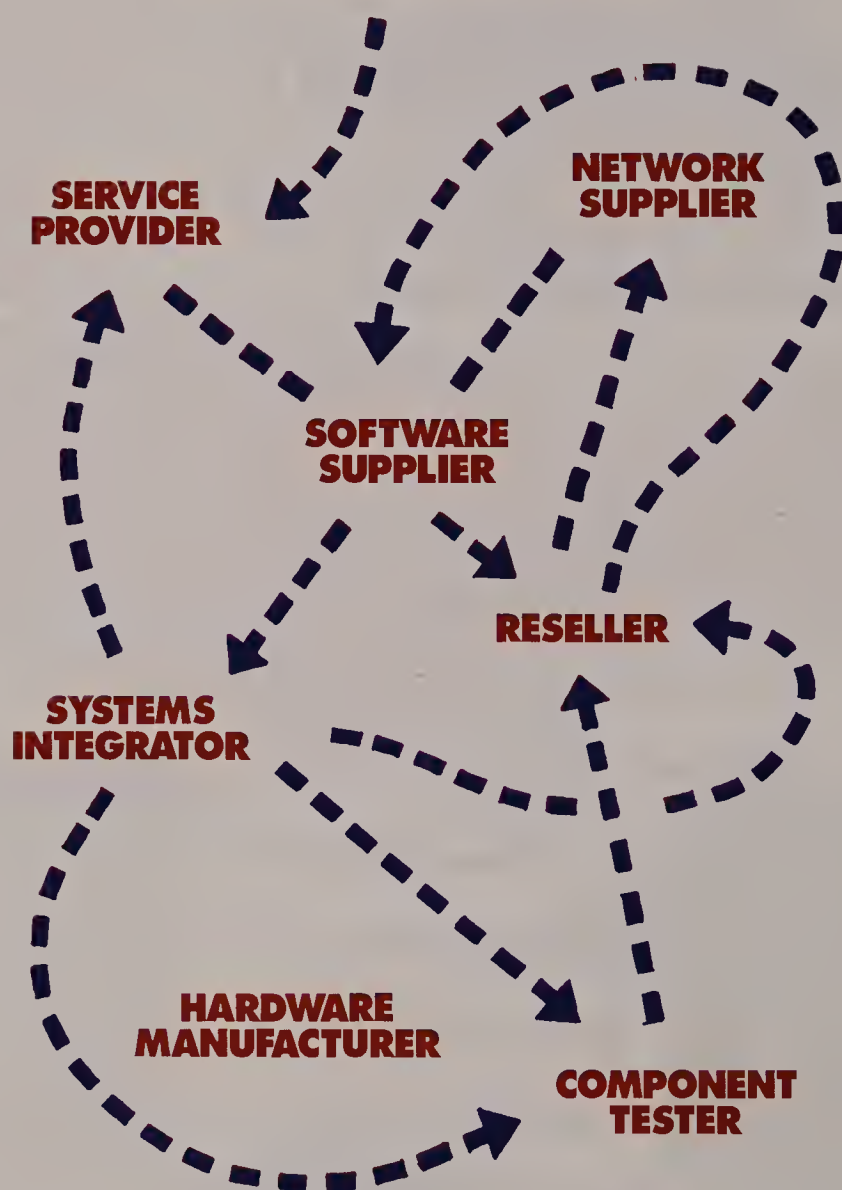
And of course with all those middlepeople relegated to the sidelines, we're usually able to give you more muscle for less money.

Give us a call. Unless you're looking for the grand tour, we're the most pleasant way to get from where you are to where you want to be.

BULL.

BU

YOUR BUSINESS.



PENTIUM PRO
PROCESSOR

†For a complete copy of our Limited Warranties, please write to Dell USA L.P., 2214 W. Braker Lane, Suite D, Austin, TX 78758. ‡Business leasing arranged by Leasing Group, Inc. On-site service and support available in certain remote locations. *Prices and specifications valid in the U.S. only and subject to change without notice. Intel, Pentium and the Intel Inside Pentium Pro logo and are registered trademarks of Microsoft Corporation. 3Com and EtherLink are registered trademarks of 3Com Corporation. ©1996 Dell Computer Corporation. All rights reserved.



DELL OPTIPLEX.
OPTIMIZED FOR COMPLEX
NETWORK ENVIRONMENTS.

ULLETPROOF.

YOUR BUSINESS.



DELL.

DELL® OPTIPLEX® GX^{pro} 180

180MHz PENTIUM® PRO PROCESSOR

- NEW Tool-less Convertible Chassis
- 64MB EDO ECC DIMM Memory
- 256KB Integrated L2 Cache
- 3GB EIDE Hard Drive (10ms)
- Dell 17LS Monitor (15.7" v.i.s.)
- S3 Trio 64V+ PCI with 2MB VRAM
- 8X EIDE CD-ROM Drive
- Integrated Vibra 16 Audio
- Integrated 3Com® PCI EtherLink® III
- Windows NT® Workstation 4.0/
1 Year Free NT Support
- 3 Year Limited Warranty†

PICTURED SYSTEM

\$3399

Business Lease^o: \$126/Mo.
Order Code #300367

DELL OPTIPLEX GXi 166

166MHz PENTIUM PROCESSOR

- NEW Tool-less Convertible Chassis
- 32MB EDO DIMM Memory
- 256KB Pipeline Burst Cache
- 2GB EIDE Hard Drive (10ms)
- Dell 17LS Monitor (15.7" v.i.s.)
- Integrated 64-bit PCI with 2MB
DRAM with Full Motion Video
- 8X EIDE CD-ROM Drive
- Integrated Sound Blaster Pro
Compatible Audio
- Integrated 3Com 10/100 PCI EtherLink III
- Microsoft Windows 95/30 Days
Free Support
- 3 Year Limited Warranty

\$2799

Business Lease: \$104/Mo.
Order Code #300365

DELL OPTIPLEX GXi 200

200MHz PENTIUM PROCESSOR

- NEW Tool-less Convertible Chassis
- 32MB EDO DIMM Memory
- 256KB Pipeline Burst Cache
- 3GB EIDE Hard Drive (10ms)
- Dell 17LS Monitor (15.7" v.i.s.)
- Integrated 64-bit PCI with 2MB
DRAM with Full Motion Video
- 8X EIDE CD-ROM Drive
- Integrated Sound Blaster Pro
Compatible Audio
- Integrated 3Com 10/100 PCI EtherLink III
- Microsoft Windows 95/30 Days
Free Support
- 3 Year Limited Warranty

\$3199

Business Lease: \$119/Mo.
Order Code #300366

DELL OPTIPLEX Gs 133

133MHz PENTIUM PROCESSOR

- NEW Tool-less Convertible Chassis
- 32MB EDO Memory
- 256KB Pipeline Burst Cache
- 2GB EIDE Hard Drive (10ms)
- Dell 15LS Monitor (13.7" v.i.s.)
- Integrated 64-bit PCI with 1MB
DRAM with Full Motion Video
- 8X EIDE CD-ROM Drive
- Integrated 3Com EtherLink III
- Microsoft Windows 95/30 Days
Free Support
- 3 Year Limited Warranty

PICTURED SYSTEM

\$2199

Business Lease: \$82/Mo.
Order Code #300364

DELL®

800-626-9525

<http://www.dell.com>

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT
Sun 12pm-5pm In Canada, call 800-839-0148

Keycode #13030

QUALITY STANDARDS

That scenario may seem a little far-fetched, but QS 9000, a set of quality guidelines for the automotive industry, is a very real concern for an estimated 13,000 first-tier automotive suppliers in the United States. If they can't comply with the registration requirements by

& Young LLP. That leaves approximately 11,700 suppliers less than a year to complete a process that takes 12 to 18 months, according to Los Altos, Calif.-based consultancy David Butler Associates Inc. There's a good chance a significant number won't make it.

ALL TOLD, a company can expect to spend from \$100,000 to \$2 million to become QS 9000 certified.

Chrysler's July 31, 1997, deadline, they're plain out of luck—and out of customers. (GM's deadline is Dec. 31, 1997; Ford has yet to set a date.) So far, only 10 percent of auto-supplier facilities have achieved certification, says Bill King, a Detroit-based partner at Ernst

As auto suppliers race to meet the deadline, their plight raises an important question: Are quality standards a good idea or an unnecessary burden? The issue is germane to CIOs in all industries because sooner or later, says King, they will be required to comply with ISO 9000 or an

Quality Control

CIOs' agendas are already packed. Should they include spearheading quality certification efforts too?

GETTING 40 OR 50 DIFFERENT plants to meet a quality standard is a lot like rolling out a new manufacturing system to multiple locations. For that reason, many experts believe CIOs ought to lead their companies' quality certification efforts. After all, compliance with a standard like QS 9000 generally requires improving document management systems by building a central data repository, upgrading computer equipment, and establishing EDI and other communications links—all of which require the appropriate information infrastructure. And since companies must renew QS 9000 certification every three years and pass a series of surveillance audits every six months, a CIO can help automate systems in such a way that they consistently function well. "The CIO has skills and capabilities in project management and can serve as a knowledge manager so that best practices are identified, which saves time and effort," says Bill King, a Detroit-based partner at Ernst & Young LLP.

Yet, at least in the automotive industry, a company's quality organization tends to lead the standards effort; IS is involved only 1 or 2 percent of the time, says Hugh Littleton, who serves as ISO and QS 9000 project manager for Cuyahoga Community College in Cleveland and has been commissioned by the state of Ohio to help certify its auto-supplier organizations. Part of the reason for low IS involvement is that automotive CIOs don't recognize the enormous opportunity that the Big Three have dropped in their laps, says Niles Redden, director of systems and process management for UT Automotive's wiring systems unit in Dearborn, Mich. QS 9000 offers a chance for CIOs to assert themselves in the business realm and to hasten new technology purchases. Redden knew his company was considering investing in a corporate intranet and used QS 9000 as a business case to push it through faster. "QS 9000 is an opportunity for CIOs to walk through the door and get more involved with the business," he concludes. —J. Bresnahan

industry-specific equivalent. And for companies with global ambitions, it will likely be sooner because ISO 9000 compliance is already "pretty much a condition of doing business in Europe," he says. "If I were a CIO, I'd get ahead of the curve and figure out the business value of achieving certification. It's lead or follow; getting out of the way isn't an option." (See "Will Standards Pay Off," Page 86.)

THE NOTION OF quality standards originated during World War II when Allied manufacturers cranked out goods of inconsistent quality, prompting worries that a shoddily manufactured bomb might accidentally explode in the face of an Allied soldier. In the late 1940s, a nonprofit group called the International Organization for Standardization (ISO) was formed in Geneva to develop basic requirements for quality management and quality assurance systems. Since then, each automaker has developed its own version of quality standards, complicating life for suppliers. When suppliers began to clamor for a single set of standards, the Big Three and truck manufacturers banded together to create QS 9000, which incorporates all of the ISO standards as well as guidelines specific to the auto industry and the objective of continuous improvement.

"The goal of the QS quality system is to put quality as the top priority in front of everyone for the sake of the customer," says Ally Hamood, chairman of Milwaukee-based American Society for Quality Control's automotive division. By making quality a priority, presumably QS 9000 will safeguard against incidents like Ford's April 1996 recall of some 8 million cars, minivans and pickups due to a faulty ignition switch. That little switch, which caused fires in hundreds of vehicles, cost Ford hundreds of millions of dollars. The switch supplier, UT Automotive in Dearborn, Mich., was not QS 9000 certified at the time. Would certification have made a difference?

Not necessarily, says Anthony Friscia, president of Boston-based consultancy Advanced Manufacturing Research. "QS 9000 is called a quality management program, but it doesn't demand that your products or customer satisfaction be high quality," he says. "It just requires that your systems are documented acceptably. You

Intellectual Capitalism



You win because you know more. But now you have to know it all faster. And how to use it. Right away. Even when there's no time to collaborate with specialists whose ten years of experience is the firm's intellectual capital. Their knowledge is available. It's somewhere online. You just have to find it, understand it, and apply it. Correctly. The first time. You can—with CBR3 Content Navigator™ from Inference Corporation, the leading provider of tools and services that help people in business solve problems for customers, prospects, vendors, and colleagues.

CBR3 Content Navigator can help you succeed. It can organize and categorize all your information and guide you to solve problems, answer questions, research subjects, or explain policies. No matter how fast the information might change.

From text to multimedia, CBR3 Content Navigator provides a common access mechanism for intelligent, natural language, interactive search and retrieval of anything online. And it works with the systems you already have—databases, visual and textual data, even the Internet—helping people find the right solution in the least amount of time.

To learn how CBR products are helping more than 500 leading corporations earn a higher return on information, call 1-800-322-9923, send an e-mail to info@inference.com, or visit www.inference.com/cbr3 today.

Helping people work smarter™

Inference®

QUALITY STANDARDS

can come up with procedures and make sure your employees operate by those procedures, but at the end of the day, what comes out may not be a high-quality product or high customer satisfaction, because that's not what's being measured."

"There's no guarantee of higher quality, that's true," says Warren Norrid, director of external affairs and tooling and equipment supplier quality assurance at Chrysler's procurement and supply organization. "People can go after a certificate or after the true intent of QS 9000. Some people might be upset, but in the long term, the discipline it brings to American manufacturing is just outstanding."

Most suppliers claim to agree that QS 9000 will be a boon. According to a June 1996 Ernst & Young survey of 85 suppliers, 79 percent believe QS 9000 will yield improved business processes, 76 percent think it'll improve internal communication and 71 percent expect greater customer satisfaction. "QS 9000 will allow us to communicate better with our associates and do our job better," says Jack Tyson, UT Automotive's manager of business improvement for wiring systems. "If that equates into defect prevention, it's very possible [that problems like the faulty switch] could be avoided. QS 9000 is one of the best things that could've happened to our industry."

ALTHOUGH MOST suppliers concur (at least publicly) that standards are a good idea, living up to them isn't easy. Becoming QS 9000 certified is expensive and time-consuming—so much so that Illinois, Indiana, Massachusetts, Michigan, Ohio and Wisconsin are all pitching in to help their sup-

pliers get certified. Companies must pay for new equipment, consulting and education, not to mention a third-party registrar to validate certification. Mirror manufacturer Ichikoh Manufacturing Inc. in Shelbyville, Ky., for example, is investing

another full audit, the whole company could miss out on weeks or months of business. Even if a supplier's Big Three customers "forgive" it for failing to meet certification deadlines, such slip-ups certainly won't impress them. And with

"WE'VE FORGOTTEN HOW to think as entrepreneurs. Now, as we rewrite our procedures, we're asking questions like, 'Do we have to do this?'"—Jack Tyson

a considerable amount of money in upgrading computer systems to improve cross-functional communication and collaboration. All told, a company can expect to spend anywhere from \$100,000 to \$2 million to become certified, says Friscia. Another big cost, according to Ichikoh's QS 9000 coordinator, Zdenko Fruhwirth, is lost productivity. Fruhwirth dedicated two and a half months to training Ichikoh's staff on QS 9000, working both first and second shifts.

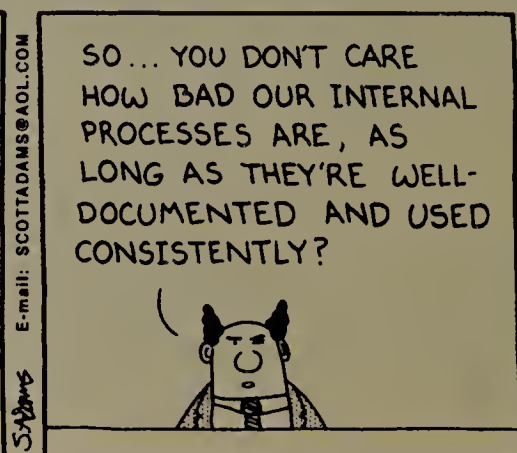
But there's no guarantee that the money and time spent will be worth it. One wrong move and a company could conceivably end up out of commission. For instance, a company with multiple sites can opt to be certified as a single organization or as a collection of individual sites. If the company goes for corporatewide compliance and "one site fails an audit, then the entire company loses," says Bruce Fischer, director of business development at Eden Prairie, Minn.-based Reality Interactive Inc., a vendor of multimedia ISO and QS 9000 training software. While the problematic site resolves the issue and endures

automakers looking for excuses to winnow their supplier lists, says Friscia, suppliers can't afford to do anything less than impress.

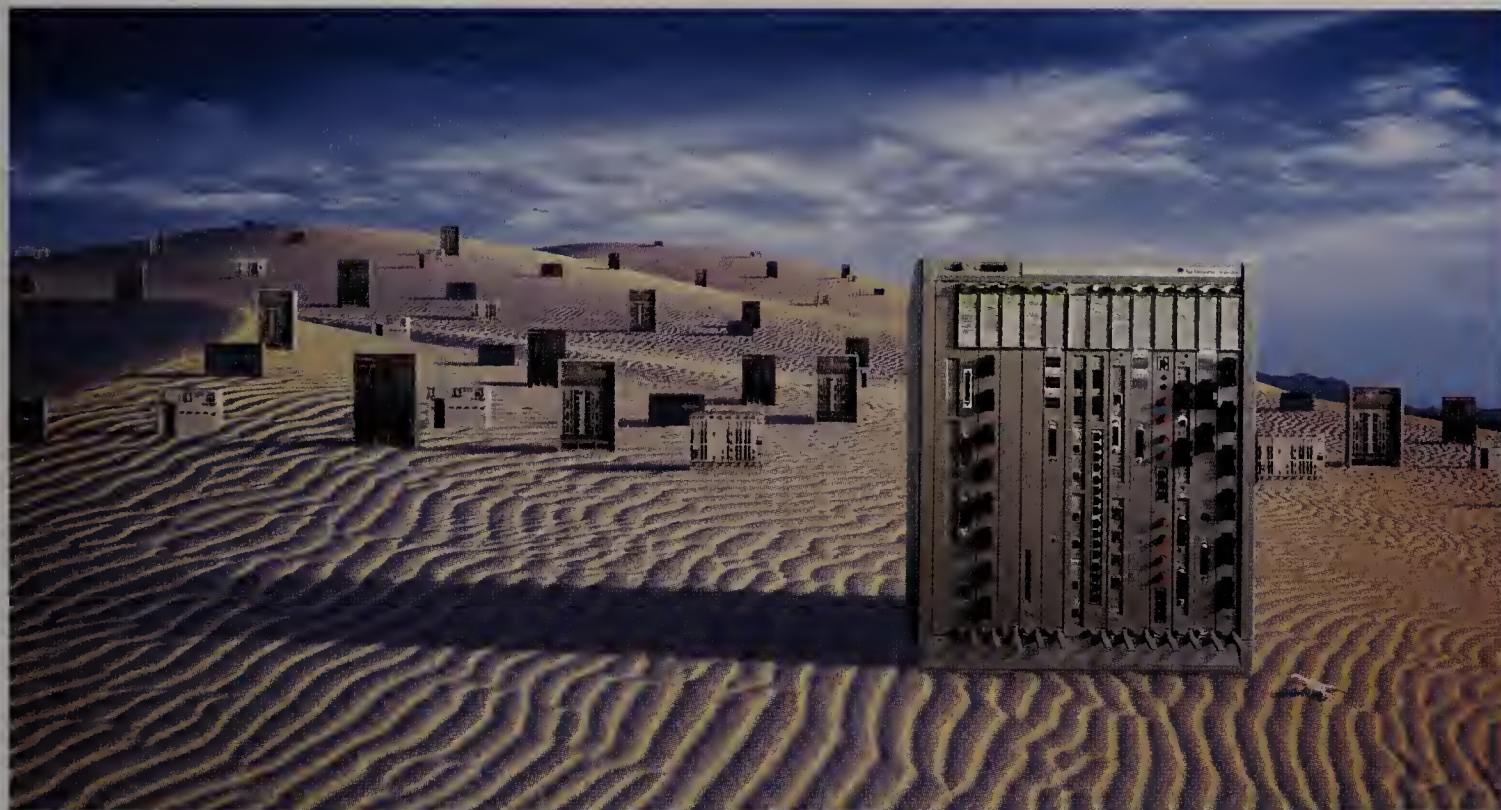
On the other hand, large companies that decide to certify each site individually risk ending up with disparate systems. George Potter, president of quality software vendor Quality Systems International Inc. in Woburn, Mass., tells of one client striving for ISO certification. That company, with 112 plants worldwide, "rushed around cobbling things together to try to meet deadlines, creating hodgepodge systems," he says. As the QS 9000 deadline looms nearer, such disappointing results could become more common—particularly if CIOs fail to get involved (see "Quality Control," Page 82).

OTHERS ARGUE THAT companies grumbling over the hassles of QS 9000 aren't seeing the bigger picture. Suppliers can approach it as a tedious burden or an opportunity to improve business processes. Those that simply go through the motions will fall behind those that seize the chance to

DILBERT by Scott Adams



Less Is More.



You can buy standalone network products forever.
Or get the System 5000 today.

Bay Networks System 5000™ simplifies networking by integrating technologies in a single platform. Integration means savings and flexibility. Plus, more management control over your network with Optivity®, the industry's leading network management solution. Best of all, the System 5000 lets you easily move from Ethernet switching today to ATM switching tomorrow. Call 1-800-8-BAYNET ext.216 for a free guide to switched internetworking, or see it online at www.baynetworks.com/more.



Shared Media & Configuration Switching

Ethernet
Token Ring
FDDI

LAN Switching

Ethernet
Fast Ethernet

ATM

Switching
Virtual Network Routing

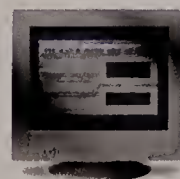
LAN Routing

Ethernet
Token Ring
Fast Ethernet
FDDI

WAN Routing

ISDN
Frame Relay
Leased Line
X.25
SMDS

Remote Access & Communications Services



Optivity®. The leading network management solution.



evaluate, improve, trim and integrate. UT Automotive, for example, is taking full advantage of the opportunity to gain competitive advantage. "This is good business sense," says Tyson. "Over the years, we've forgotten how to think as entrepreneurs. Now, as we rewrite our procedures, we're asking questions like, 'Do we have to do this?' We're trimming waste."

The \$3 billion manufacturer decided to streamline operations by consolidating its systems into a companywide intranet. It had been planning to invest in an intranet for some time, but QS 9000 made it happen sooner, says Niles Redden, director of systems and process management for the company's wiring systems unit. Now in the early stages of complying with QS 9000, UT Automotive will put policies and procedures online for internal reference, and eventually customers will be able to view selected material on the site. Employees at more than 90 plants worldwide will be able to use Netscape browsers to access the intranet to communicate and share resources and documents.

EVEN FOR suppliers already out in front technologically, complying with QS 9000 can yield business benefits. Pro-Tech Coding Co., a galvanized steel manufacturer in Leipsic, Ohio, began operating in 1993 as the prototype of a modern, efficient manufacturing facility. Operations are fully automated with state-of-the-art technology, and employees are linked to an IBM

Will Standards Pay Off?

A checklist for companies contemplating standards compliance

AUTOMOTIVE suppliers don't have a choice: They have to comply with QS 9000 standards by as early as next summer if they want to do business with the Big Three. But for companies in industries in which ISO 9000 or other industry-specific standards are merely lurking on the horizon, Detroit-based Ernst & Young LLP partner Bill King advises asking the following questions before getting a jump start on certification:

- Will upper management fully support the certification initiative?
 - Is the company ready to offer training at all levels?
 - What competitive advantage and best practices could be gained from early adoption of standards?
- "If certification is not driven from the top and it isn't one of the objectives of the company," says King, "the bottom line is that QS or ISO will not work."

—J. Bresnahan

compliance will be negligible for Pro-Tech: The company doesn't need to add personnel, revamp the corporate culture, buy new hardware or resolve messy integration issues.

For suppliers less technologically advanced than Pro-Tech, the road to QS 9000 certification isn't as smooth. Although Willoughby, Ohio-based screw machine shop Metal Seal & Products Inc. began the certification process in early 1995, personnel changes quickly brought everything to a halt. To further complicate matters, "nobody was given responsibility to fix the things that people found wrong," says QS Coordinator Jerry Foster. His QS team, which includes representatives from the IS and quality

while, but this has facilitated it," says Foster. Employees can now use the mainframe to analyze trends rather than lay out pieces of paper side by side.

At Ichikoh, departments in the United States and Japan once had trouble collaborating because they lacked PCs. Now, as a result of QS 9000, departments form cross-functional teams and communicate over a computer network using CAD systems. For the first time, cross-departmental analyses and corrections are possible.

Yet not everybody at Ichikoh is thrilled about QS 9000. Ichikoh Manufacturing started operations eight years ago in Kentucky, but its Japanese parent, Ichikoh Industries Ltd., has been around since 1903. Fruhwirth says his Japanese associates are reluctant to accept QS 9000 certification because they think their existing quality systems are just as good as or even better than QS 9000. "They don't think they need it, but they're doing it because they have to," he says.

Regardless of whether suppliers see QS 9000 as foul or fair play, they don't have much choice. So they might as well make the most of it. "If we want to sit back and cry that somebody's making us do something that we don't want to do, maybe we're in the wrong business," says Hamood. "Well-thought-out procedures are in the best interest of the customer, the worker, the employee, leadership and all the stakeholders." **CIO**

Staff Writer Jennifer Bresnahan can be reached at jennifer@cio.com.

SUPPLIERS CAN APPROACH quality standards as a tedious burden or an opportunity to improve business processes.

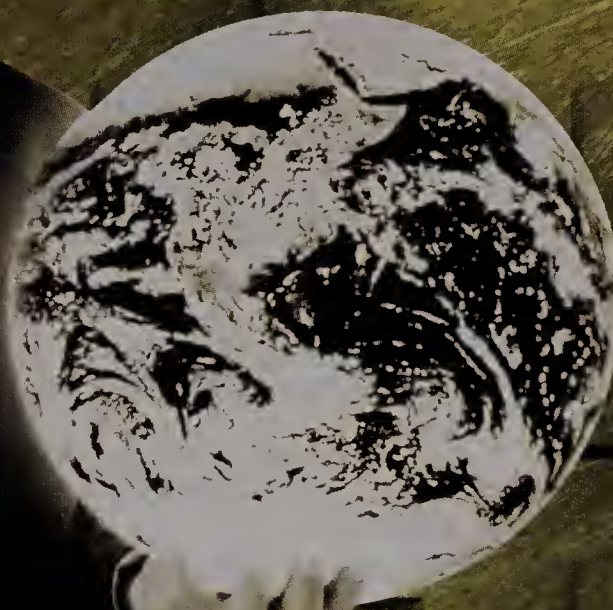
mainframe via a local PC network. Yet CFO Ron Sloan, who serves as de facto corporate CIO, doesn't resent having to go through the steps of compliance. "When you make a conscious effort every day over a long period of time, quality will improve," he says. "It's like with your children: They will think something is important if you think it's important. Our workers will think quality is important if executive management thinks it's important." Sloan believes the cost of

departments, tried to resume the project last December, only to discover that they had to dismantle and rebuild existing systems that weren't up to par. Some systems that weren't computerized had to be built from scratch.

But QS 9000 has also helped MS&P justify overdue technology investments. When the company's new quality systems overtaxed its old IBM 36 mainframe, it upgraded to an IBM AS/400. "We were looking at getting a new computer for a

Isn't it time you thought about networking people and information instead of hardware?

We have.



Introducing The Virtual IP Network, only from FTP Software.
Secure, open connections that extend the reach of your business.

Your users are located everywhere. Just like your information. Connecting both in a totally open, yet secure, managed environment is what our networking strategy is all about. We call it the Virtual IP Network – the FTP Software family of products that provide IS managers with new levels of security, manageability, customization, and connectivity based on user profiles instead of IP addresses. So users get the information they need, and you get the control you demand. Imagine the productivity potential. The cornerstones are ready now – OnNet[®]32 and Internet Gateway for NetWare – with more to come. Curious about Virtual IP Networks? Call us for your Virtual IP Network information packet or visit our Web site.

1-800-282-4FTP, ext. 5308 • <http://www.ftp.com/vip/a210>

FTP Software, the FTP Software logo, and OnNet are registered trademarks of FTP Software, Inc.



smart.secure.open.connections
Because the only connections that matter are YOURS.

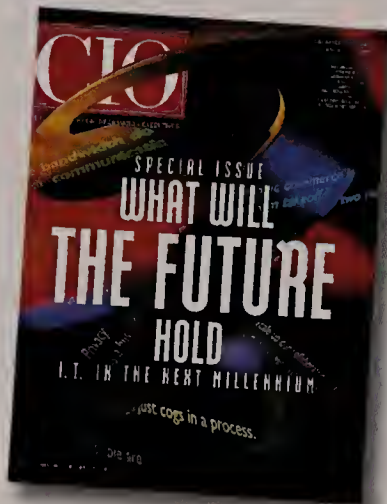
the Year in review

An index of all major articles published in *CIO* in 1996,
including a cross-reference by article type

**DECEMBER 15, 1995/
JANUARY 1, 1996**

Special Issue: IT in the Next Millennium

1058. "Introduction: What Will the Future Hold?" (Page 36)—in this special year-end issue, we explore IT and business trends in the next millennium.



1059. "The Yellow Brick Road" (Page 38)—we may not know what lies at the end of this path we're on, but one thing's for sure—this isn't Kansas anymore. By Lynda Radosevich

1060. "The Adventures of Orrin Fancher, New Age CIO" (Page 54)—meet fictitious future CIO Orrin Fancher. By Lew McCreary

1061. "Going the Distance" (Page 62)—technology pioneers experiment with faster, cheaper ways to deliver data, text, graphics, sound and video. By Anne Stuart

1062. "Communications: Anywhere, Anytime, Any

Medium, Any Day Now" (Page 72)—leading technology developers explain what they're working on and describe what kind of world these products might help shape.

1063. "Into the Futures" (Page 26)—traditional strategic planning is fine for a stable, predictable world. So what do we

do now? An Insights column by Susan Grandpierre

1064. "The Future of Knowledge Management" (Page 30)—effective knowledge management will hinge on people, not technology. A Think Tank column by Tom Davenport

1065. "New Year's Evil" (Page 82)—with a virtual time bomb

ticking away in mainframes everywhere, the year 2000 poses some serious threats. A State of the Art column by John Edwards

1066. "Future Shtick" (Page 96)—find out what your customers and competitors will be doing in the year 3000 and beyond. A CIO Light column by Ezra Poundcake

Categorically Speaking

Articles are numbered in sequence from the first issue of CIO. (See previous December issues for guides to stories published prior to January 1996.) To find articles of interest, refer to the category listings below. For example, readers interested in online strategies would look up 1140 and 1156. An online index of articles dating back to January 1993 is available on the World Wide Web at www.cio.com/CIO/cio_back_issues.html. To purchase back issues or reprints, call Ancillary Products at 800 343-4935, Ext. 4539.

Business/Management Issues 1059, 1063, 1067, 1072, 1080, 1086, 1100, 1103, 1104, 1105, 1110, 1111, 1118, 1121, 1125, 1126, 1127, 1134, 1142, 1145, 1149, 1151, 1153, 1170, 1175, 1177, 1192, 1218, 1219

The CIO Role 1060, 1083, 1084, 1098, 1119, 1130, 1139, 1149, 1152, 1164, 1181, 1191, 1198, 1199, 1200, 1201, 1202, 1210, 1214, 1215

Client/Server-Open Systems 1079, 1115, 1117, 1124, 1133, 1141, 1168, 1169, 1192, 1207, 1216, 1217

Communications Technology/Networking 1061, 1062, 1070, 1090, 1102, 1172, 1174, 1213, 1224

Databases/Data Warehousing 1108, 1109, 1135, 1182, 1183, 1184, 1185, 1186, 1187, 1189, 1190

Downsizing/Outsourcing 1125, 1126, 1127, 1128, 1134, 1167

Enterprise Value/Return on Investment 1074, 1075, 1076, 1077, 1078, 1079, 1082, 1087, 1102, 1107, 1110, 1111, 1115, 1117, 1124, 1129, 1133, 1141, 1148, 1157, 1185, 1187, 1190, 1209, 1224

Global Issues 1070, 1097, 1103, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1167, 1194, 1214, 1219

Industry Overviews 1085, 1120, 1144, 1151

Information Assets/Knowledge Management 1064, 1086, 1097, 1106, 1114, 1122, 1134, 1138, 1179

IS Strategies 1059, 1061, 1067, 1074, 1075, 1076, 1077, 1078, 1079, 1091, 1093, 1097, 1103, 1105, 1110, 1111, 1112, 1113, 1118, 1121, 1131, 1135, 1137, 1142, 1143, 1145, 1147, 1150, 1153, 1154, 1168, 1170, 1173, 1176, 1177, 1181, 1183, 1191, 1193, 1198, 1203, 1207, 1217, 1221, 1222

Online Technology/Strategy 1059, 1080, 1091, 1098, 1120, 1139, 1140, 1156, 1180, 1186, 1208

Organizational Change/Human Resources Issues 1083, 1084, 1094, 1096, 1119, 1134, 1171, 1175, 1194, 1195, 1196, 1204, 1205, 1210, 1211, 1212

Reengineering 1099, 1105, 1121, 1136, 1151, 1218

Technology Overviews 1065, 1069, 1071, 1081, 1088, 1090, 1091, 1095, 1101, 1108, 1116, 1123, 1132, 1140, 1156, 1169, 1172, 1174, 1179, 1180, 1189, 1197, 1206, 1213, 1216, 1223

User/Customer Relations 1071, 1078, 1093, 2012, 1144, 1150, 1154, 1155, 1178, 1184, 1193, 1209

This is your mother.

You got hungry, she fed you.
You got picked on, she protected you.
You got sick, she made you chicken
soup. You got a birthday, you still
get a couple of tens in a card
with a sappy, rhyming message.



You can rely on your mother.

This is a Sun™ server.

You got a business network,
it's always up and running.



It's like your mother.
(Kinda spooky, isn't it?)

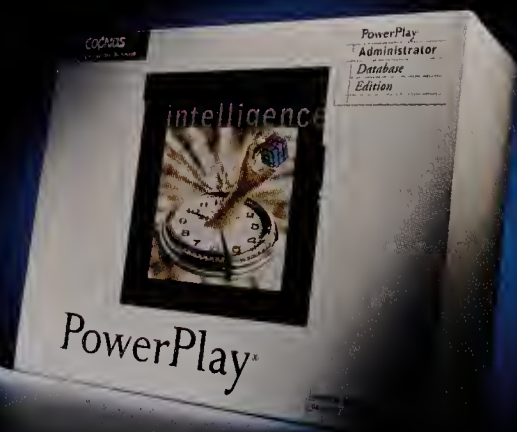
Mom, St. Bernards, Swiss watches – what could be as reliable? The Sun™ Ultra™ Enterprise™ family of servers, of course. Where you'll find that kind of reliability in our complete range of systems and storage. From workgroup servers to high availability clusters and fault tolerant systems. We could go on, but your mother would say we were bragging. Naturally, all our systems are designed with maximum redundancy—to avoid single points of failure. Modular components are easily serviced and swappable online. Software tools fully monitor systems and provide pre-failure warnings. And Solaris™, our proven, robust operating environment is ideal for mission critical apps. Even our service and support teams are obsessed with achieving 100% uptime. *Uh oh, we've obviously impressed your mother. But don't worry, she still loves you best.* For more information contact us at <http://www.sun.com> or call 1-800-786-0785, Ext. 465. **THE NETWORK IS THE COMPUTER™**



P o w e r P l a y™

5.0h!

THE WORLD'S MOST POPULAR OLAP TOOL
IS NOW THE PERFECT ENTERPRISE SOLUTION.



DOWNLOAD
A DEMO TODAY.

HTTP:
//
WWW
•
COGNOS
•
COM/IS3

IT WILL LEAVE
YOU BREATHLESS.

Sit up. Take notice. PowerPlay 5.0 takes OLAP into new dimensions with awe-inspiring features. **A performance high!** PowerPlay puts data warehouses on the desktop – turning your OLAP and relational databases* into goldmines. Explore much more data quicker, packing millions of records into every cube. **This is easy!** Graphs. Charts. Tables. You drag, you drop, you see your data your way. You drill through to the details in the original database with a single click. *Plus* client/server PowerPlay piggybacks on your existing relational database – making admin and replication simple. **Deploy quickly!** Create OLAP cubes on PCs, UNIX servers or in relational databases . . . then deploy them however you want. **Scale new heights!** 5.0 is truly enterprise-capable. And with access to OLAP servers such as Arbor EssBase, Oracle Express and others, PowerPlay has redefined "open for business." PowerPlay 5.0: the perfect enterprise solution. **Ah! The victory.**

COGNOS®

TOOLS THAT BUILD BUSINESS™

* Oracle,* Sybase,* SQL Servers, and others.

©1996 Cognos . Cognos, PowerPlay and "Tools That Build Business" are registered trademarks or trademarks of Cognos, Inc. All other trademarks are the properties of their respective companies.

JANUARY 15, 1996

Special Focus: IT Purchasing

1067. "Acquiring Minds" (Page 30)—a roundtable of IS and procurement experts looks at the changing environment for IT purchasing and its effect on the CIO role. By Mickey Williamson

1068. "CIO's 1995 Reader's Choice Awards" (Page 42)—what are you buying? Our research group surveyed readers and came up with a list of leading technology vendors and products.

1069. "Making Brain Waves" (Page 22)—after a decade of frustrated hopes and disappointments in the corporate arena, artificial intelligence is on the rise again, thanks to the increasing success of neural networks. By E.B. Baatz

1070. "Great Expectations" (Page 46)—SWIFT's customers want flawless service, but in their capacity as owners, they also have an eye on the bottom line.

A European Spotlight feature by Richard Pastore

1071. "When Doing Equals Learning" (Page 52)—organizations look for ways to erase the line between training and work. A State of the Art column on electronic performance support systems by Tracy Mayor

1072. "Their Methods Aren't Madness" (Page 72)—CIO-turned-consultant W.F. Dyle explained in a recent "CIO Confidential" column why he had little use for consulting methodologies. His new colleagues beg to differ.

FEBRUARY 1, 1996

Special Issue: The Enterprise Value Awards

1073. "Mining for Gold" (Page 24)—this year's EVA winners have extracted real value from challenging conditions. By Abbie Lundberg

1074. "Birds on a Wire" (Page 28)—by putting product information online, McDonnell



Douglas Helicopter Systems helps its salespeople close deals on the fly. By Megan Santosus

1075. "A Speedy Recovery" (Page 34)—Brigham & Women's Hospital's computer medical order entry system warns staff before problems happen. By Peter Fabris

1076. "Power Launch" (Page 38)—a new document storage system at Rockwell International shaved weeks off space shuttle schedules and saved the company an astronomical sum. By Carol Hildebrand

1077. "A Bargain at 15 Cents" (Page 42)—United HealthCare deployed artificial intelligence and cut the cost of each claim review to three nickels. By Anne Knowles

1078. "Full-Service Stations" (Page 46)—customers get their fill of help from Gensym Corp.'s innovative support system. By Carol Hildebrand

1079. "Orders of Magnitude" (Page 52)—thanks to its new enterprise information system, Telogy Inc. has slashed order fulfillment from 11 days to three while accommodating tremendous growth. By Peter Fabris

1080. "Seven Syllables of Salience" (Page 20)—today more than ever, IT has the potential to cut out the middleman. A Think Tank column on disintermediation by Tom Davenport

1081. "Endless Possibilities" (Page 56)—tools that simulate what-if scenarios show managers that a picture is worth a thousand words. A State of the

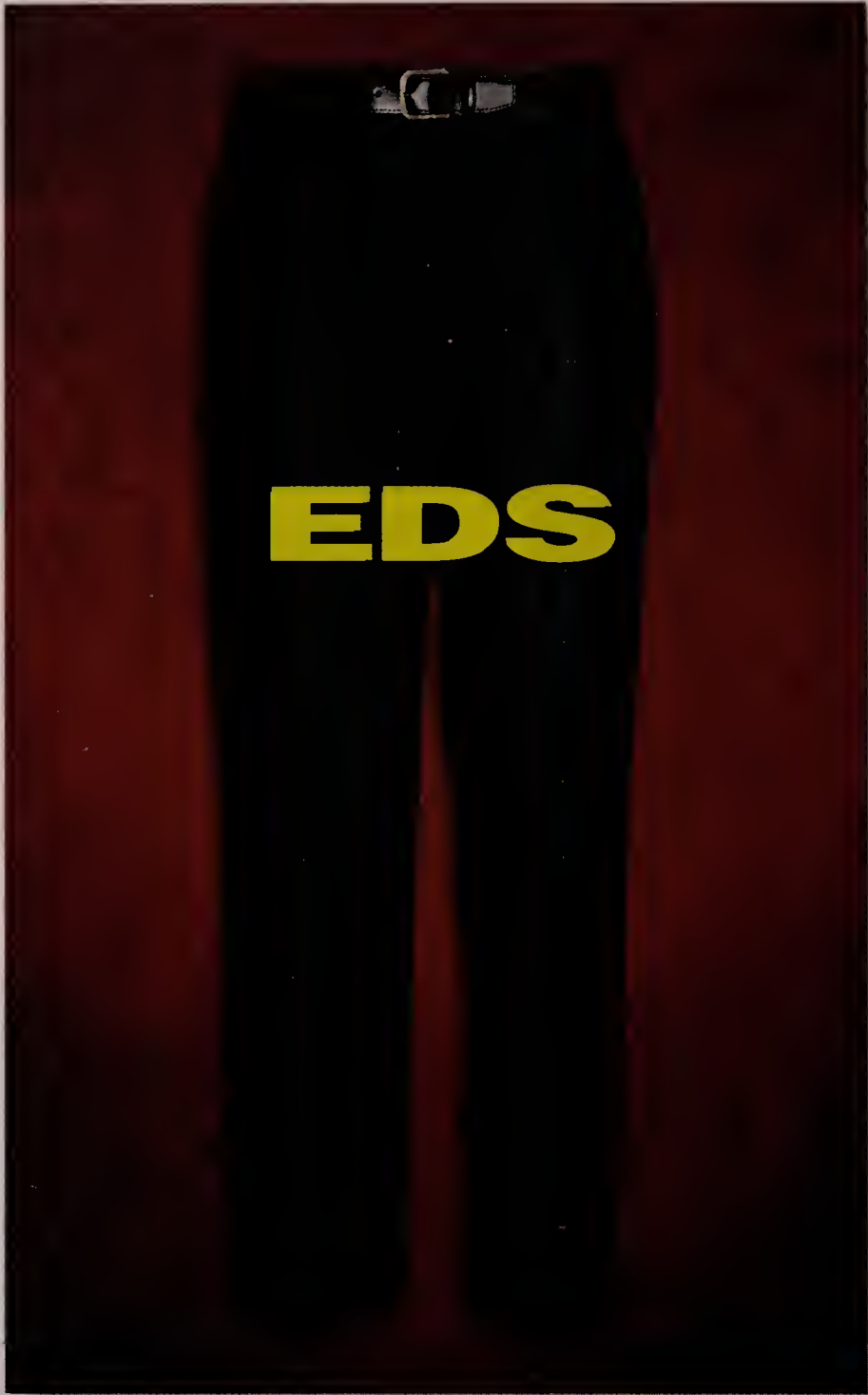


People who own pets and purchase exercise equipment.

A data warehouse with RS/6000 and Red Brick.
You'd be surprised at what you can find.

IBM

Solutions for a small planet™



EDS



**WITHOUT
THE
STARCH.**

▼ The button-down attitude was fine in the mainframe world, but now the computing world has rapidly expanded. With thousands of PCs and servers, today's IT environment demands more flexibility, and more rapid response, from you and your suppliers. ▼ Call Vanstar, the distributed computing experts. We offer the life cycle services you need to manage your IT growth: consulting and design, network planning, integration, procurement, financing, installation, and deskside support. ▼ With Vanstar, you choose as much, or as little, of our expertise as you need. That's why hundreds of Fortune 1000 companies have selected us to support their distributed computing environments. ▼ Please visit us at www.vanstar.com/nostarch or call us at 1-800-994-2345 to learn more. You'll get the expertise and discipline you need, without the attitude.

Vanstar
THE TECHNOLOGY SERVICES COMPANY
www.vanstar.com

WEBMASTER

The Executive Resource for Doing Business on the Net

YES, please enter my one-year subscription, 12 issues to WebMaster magazine and bill me later for \$29.97*, a savings of over \$29 off the single copy price!

Name

Title

Company Name

Address

City

State

Zip

E-mail address

Web site address

*U.S. and Canada only. Foreign rate \$65 per year, prepaid in U.S. dollars.



INCA7

**New Order --
Process Immediately!**



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO.1020 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

WEBMASTER

ATTN: CIRCULATION DEPARTMENT
PO BOX 9208
FRAMINGHAM, MA 01701-9486



Art column by Daniel Gross

1082. "Found Money" (Page 64)—a client/server-based planning system lets Arizona Public Service recover millions in lost revenues. A Working Smart column by Jennifer Bresnahan

FEBRUARY 15, 1996

Special Section: Executive Compensation and Evaluation

1083. "Full Market Value" (Page 28)—the highest-paid IS executives have the word "chief" in their titles, work for large companies and are willing to move, according to CIO's first executive compensation survey. By E.B. Baatz

1084. "Sitting in the Hot Seat" (Page 40)—the standards by which CIOs are judged are rapidly shifting—and getting tougher. By Christopher Koch

1085. "Working on the Railroad" (Page 48)—compelled to elevate their customer service

standards and reshape their competitive positions, railroads are investing in corporate and industrywide IT. By Megan Santosus

1086. "Privacy Versus Profit" (Page 56)—who should own information? An interview with communications and computer lawyer Anne Wells Branscomb. By Carol Hildebrand

1087. "Saving Grace" (Page 22)—Gartner Group presents 16 ways to save money on IT expenditures. A Gartner View column by Jerry Cooperman and Ken McGee

1088. "Mightier Mites" (Page 62)—handheld computers are becoming the more functional tool of choice for mobile workers. A State of the Art column by Dennis Livingston

MARCH 1, 1996

Special Issue: Groupware

1089. "All Together Now" (Page 28)—collaborative computing exists in cyberspace, in the cor-

porate infrastructure, in any of a thousand groupware utilities and, essentially, in the company's culture. By Carol Hildebrand

1090. "Getting a Grip on Groupware" (Page 32)—tools that enable groups to nullify the boundaries of time and geography are fast becoming a hot commodity. By Mickey Williamson

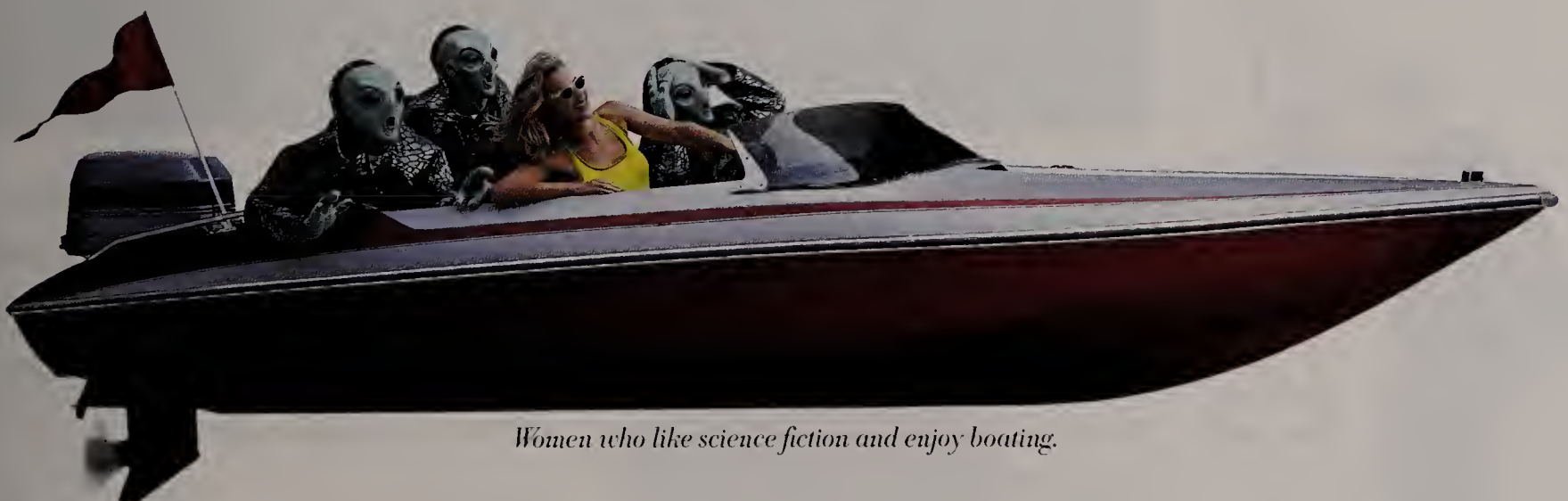
1091. "Open to Debate" (Page 42)—though the differences between Notes and the Web are diminishing, each still has distinct advantages. Business needs should determine whether you choose one or the other—or both. By Alice Dragoon

1092. "Taking Notes to the Next Level" (Page 54)—deploying Lotus's groupware to the enterprise requires software, programmers, cash and support from upper management. And the burden of proof falls squarely on IS's shoulders. By Tracy Mayor



1093. "A Little of That Human Touch" (Page 64)—corporate collaboration requires discovering and managing the behavioral and organizational factors that drive and derail many groupware efforts. By Carol Hildebrand

1094. "Software as Socialware" (Page 24)—if software is to be successful, we must pay attention to the social and behavioral changes it engenders. A Think Tank column by Tom Davenport



Women who like science fiction and enjoy boating.

A data warehouse with RS/6000 and Informix.
You'd be surprised at what you can find.

IBM.
Solutions for a small planet™

Get Ready for the Year 2000 With CIBR2000TM

The Year 2000 is almost here,
and it's bringing a powerful
computer flu with it. **CIBR2000TM**
will keep your computer system
running smoothly into the new
millennium. It's the effective
and affordable software
solution for millennium date
conversion.



CIBR2000TM is a service of CIBER, Inc., the
evolving leader in affordable computer system
solutions. Far more than an excellent staff
supplementation firm, CIBER is here to help
you every step of the way — from entry level
programming through strategic management
consulting. Over 2,000 highly trained consul-
tants serve customers in 30+ branch offices
across the country and in two foreign countries.

To find out more about CIBER's millennium
date change conversion services, please contact
Dave Ehlke at (617) 932-6305 ext. 232 or
your local CIBER office. Or visit our web site at
<http://www.ciber.com>

CIBER

For additional CIBER services, please contact us at 1-800-242-3799. Thank you.



1095. "Notable Additions" (Page 74)—the market for third-party tools has grown enormously in the last three years, creating a wealth of add-on products for Notes developers and administrators. A State of the Art column by Sally Blanning DeJean

1096. "The Lone Ranger" (Page 88)—to hell with working together! If it can't be done without the interference of others, it probably isn't worth doing at all. A CIO Light column by Ezra Poundcake

MARCH 15, 1996

1097. "Tapping New Markets" (Page 34)—a successful blend of IT consolidation and vision has helped Interbrew become a global competitor and the fourth-largest brewer in the world. A European Spotlight feature by Richard Pastore

1098. "Sky Pilots" (Page 42)—IS executives have lots of rea-

sons for delaying the takeoff into the Internet. But advance-guard CIOs who are already navigating cyberspace warn that the countdown has begun. By E.B. Baatz

1099. "To Market, To Market" (Page 48)—no matter what your company's marketing approach, the underlying concept is the same: It's got to be fast, flexible and inexpensive. By Rosemary Cafasso

1100. "The Bright Stuff" (Page 56)—according to Harvard psychologist Howard Gardner's theory of multiple intelligences, it takes more than a high IQ to be a smart manager and leader. An interview by Christopher Koch

1101. "A Mappable Feast" (Page 64)—geographic information systems have found a home in the business community. A State of the Art column by Dennis Hamilton

1102. "Grapes of Wrath" (Page 72)—frame relay and a

client/server system liberated the Kendall-Jackson winemakers from the inefficiencies of fax-based inventory management. A Working Smart column by Tam Harbert

APRIL 1, 1996

1103. "Buy Global, Skip Local" (Page 30)—global sourcing can save multinational businesses time, money and headaches. By Marsha W. Johnston



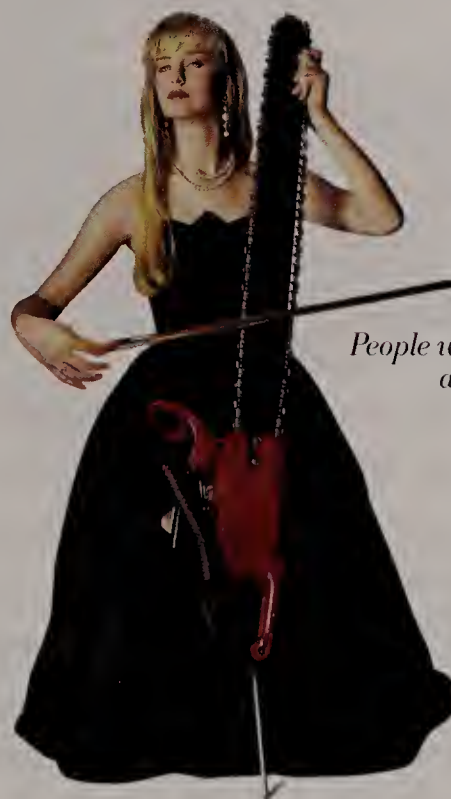
1104. "Ground Control" (Page 40)—Motorola's Iridium project includes what may be the largest commercial software effort ever undertaken. By Peter Fabris

1105. "High-Wire Act" (Page 46)—Paulsen Wire Rope Corp. is reengineering the IS function to support the company's turnaround. A Second Opinions feature by Christopher Koch

1106. "The CKO and Beyond" (Page 24)—knowledge management is all the rage. And it's not just being discussed—it's being done. A Think Tank column by Tom Davenport

1107. "Tactical Maneuvers" (Page 54)—leveraging the IS organization to create business allies was the strategic message delivered at the CIO-sponsored Enterprise Value Retreat. A Reporter's Notebook column by Megan Santosus

1108. "Warehousing Wherewithal" (Page 58)—although vendors may try to convince you otherwise, no one



People who listen to classical music and use power tools.

A data warehouse with RS/6000 and Sybase.
You'd be surprised at what you can find.

IBM
Solutions for a small planet™

New Processes for:
Data Warehousing
Year 2000 Conversion
or Development and
Internet Management

BREAK THROUGH THE DEVELOPMENT PRODUCTIVITY BARRIER WITH BEST PRACTICES!

70% schedule
improvement

90% fewer defects

350%
productivity
gains

500% ROI

LBMS PROCESS ENGINEER® - BEST PRACTICES FOR THE ENTERPRISE

Sustainable Process Improvement. That's what it's all about according to industry experts such as *Capers Jones, the Gartner Group, the Meta Group and the SEI* — the people who make their living figuring out how to make better, faster, cheaper a reality. And these experts point to **Process Management**, enabling you to achieve: **350% increase** in developer productivity; **70% improvement** in project schedules; **90% reduction** in defects; and **500% return** on investment.

With over 1,000 implementations worldwide, **Process Engineer** is the leading Process Management tool for defining, deploying, executing and improving development best practices. The **LBMS Process Library™** combines our knowledge base of best practices with that of industry experts through our **LBMS ProcessWare™ Partners Program**. We address significant development issues such as: **Enterprise Client/Server Applications, Data Warehousing, Business Process Re-engineering, Package Implementation, and Object Oriented Development**. Process Engineer enables the process library to be customized to reflect organizational best practices. Its integrated suite of tools provides authoring, process-driven planning, task and deliverable management, process improvement capabilities to all team members and provides facilities for publishing best practices on a corporate Intranet.

Break through the Barrier Today. Call us now to schedule a **Process Engineer Demo**. Register online at our Web site for the **LBMS Free Seminar Series: Process Management**. Order a **Free White Paper** on Process Management or our multimedia **Seminar On CD™**. Call us at 1-800-345-LBMS (5267) or outside the US at 713-625-9300. Visit us on the Web at www.lbms.com.

LBMS
<http://www.lbms.com>

can yet provide one-stop shopping for your data warehouse needs. A State of the Art column by Rob Mattison

1109. "My Data Warehouse" (Page 68)—your excess is our business. A CIO Light column by Tripp Strange

APRIL 15, 1996

Special Section: IT Risk Management

1110. "Taking Your Chances" (Page 36)—new pressures and higher stakes are forcing companies to rethink how they justify and oversee IT risks. By Lynda Radosevich and Cheryl Dable

1111. "A Road Map for Risk" (Page 48)—methodologies point out paths to success and paths fraught with peril. By Carol Hildebrand

1112. "Loud & Clear" (Page 56)—according to management expert Erwin Martinez, the greatest threat to the success of any IS project is a failure to communicate. By Carol Hildebrand



1113. "The Science of Software Development" (Page 62)—faced with shrinking cycle times and the threat of outsourcing, more companies are turning the dark art of software development into a science. By Mickey Williamson

1114. "In the Know" (Page 24)—building a knowledge-sharing database taught Arthur Andersen about implementing changes that fundamentally shift the way a company does business. An Insights column by Wendi Bukowitz

1115. "Client/Server Payoff" (Page 72)—the benefits of client/server projects are many, but they're not always obvious. A Gartner View column by Ken Dec

1116. "Who's Minding the Storage" (Page 78)—it's getting easier and cheaper to store data. A State of the Art column by Daniel Gross

1117. "Torrential Savings" (Page 88)—a water utility turned to client/server technology and in the process realized significant financial benefits. A Working Smart column by Jennifer Bresnahan

MAY 1, 1996

1118. "To Everything, Turn, Turn, Turn" (Page 30)—inter-company IT and increasing trust enable cheaper, faster inventory turns in a variety of industries. By Mickey Williamson

1119. "Enter the Power Elite" (Page 42)—whom do you follow to become a leader? The para-

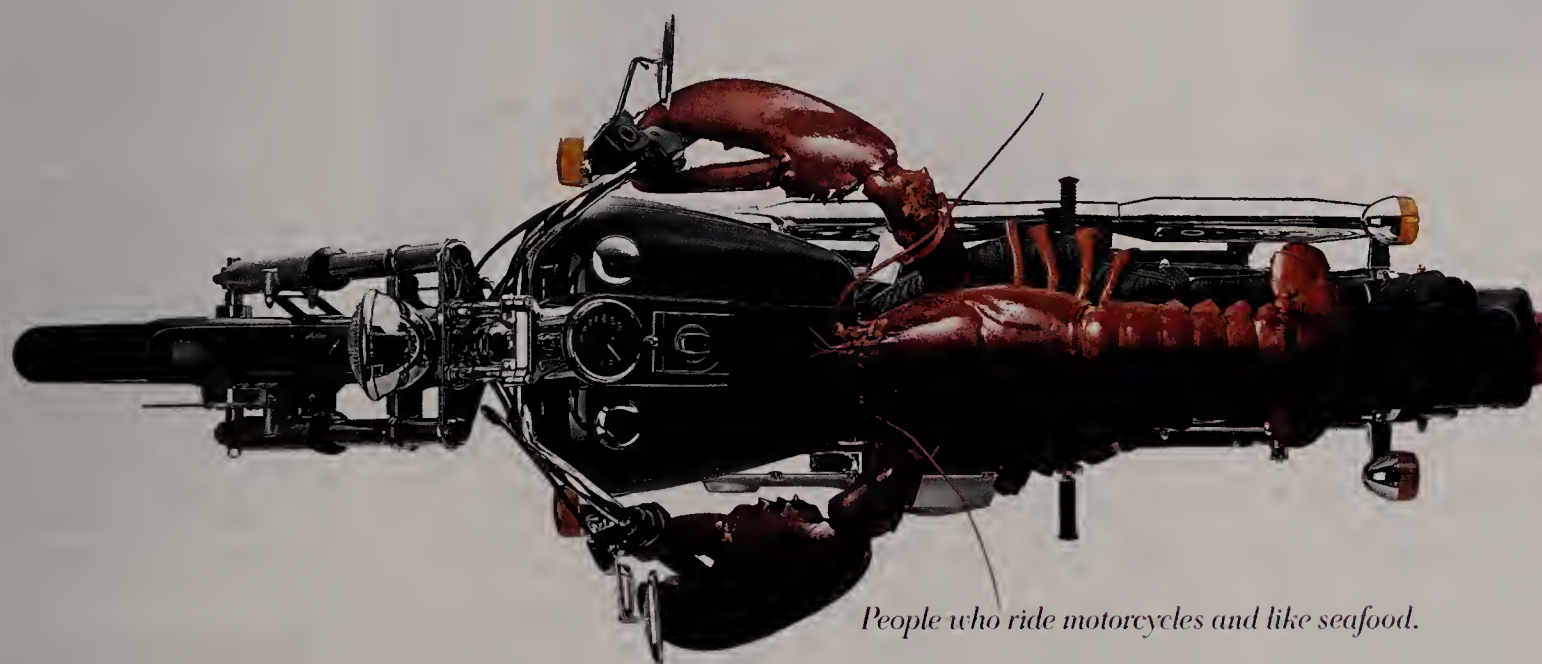
doxical question makes sense for the CIO eager to swing open the doors to the executive suite. By Christopher Koch

1120. "Perfect Pitch" (Page 54)—the art of advertising has gotten more complicated in an era of burgeoning electronic media outlets and fragmenting markets. At last, Madison Avenue is discovering the benefits of IT. By Peter Fabris

1121. "Just Do It All" (Page 64)—to attract customers, a U.K.-based home products chain had to offer more-specialized merchandise and provide superior customer service. A European Spotlight feature by Clive Couldwell

1122. "The New IBM" (Page 24)—how we search for, organize, share, attend to or ignore information is already the key limiting factor of the InfoAge. A Think Tank column by Tom Davenport

1123. "Seeing the Forest" (Page 72)—product data management systems can be applied enter-



People who ride motorcycles and like seafood.

A data warehouse with RS/6000 and Oracle.
You'd be surprised at what you can find.

Fact is. RS/6000™ runs all the leading database software: Oracle, DB2, Informix, Red Brick and Sybase. What's more, it offers unsurpassed consulting, installation, training and support services. For all applications. All of which makes RS/6000 not only an incredibly scalable server, but an amazingly flexible one, as well. What can you find in a data warehouse? Stop by www.rs6000.ibm.com or call 1 800 IBM-2468, ext. FA037.

IBM

Solutions for a small planet™

IBM is a registered trademark and RS/6000 and Solutions for a small planet are trademarks of IBM Corp. All other company and/or product names are trademarks or registered trademarks of their respective companies. The IBM home page can be found at www.ibm.com ©1996 IBM Corp.

STORY INDEX

prise-wide to help employees see beyond their own little neck of the woods. A *State of the Art* column by Ed Miller

1124. "People Power" (Page 86)—Xerox Corp.'s first venture into client/server computing has spawned financial and personnel gains. A *Working Smart* column by Carol Zarrow

MAY 15, 1996

Special Focus: Outsourcing in the '90s

1125. "The Art of the Deal" (Page 40)—as outsourcing partnerships become more the rule than the exception, CIOs learn that the give and take continues long after contract negotiations have ended. By Richard Pastore



1126. "The Odd Couple" (Page 52)—an innovative outsourcing deal between Swiss Bank and Perot Systems shows others how to think about the risks and rewards of a new kind of relationship. By Carol Hildebrand

1127. "Hanging Tough" (Page 26)—whether you renegotiate or terminate that aging outsourcing contract, you'll need to plan carefully before confronting the vendor. An *Insights* column by John K. Halvey and Daniel R. Mummery

1128. "The Provider Paradox" (Page 34)—IS managers cling to the notion that "one-stop shopping" will maximize control of their outsourcing projects, only to discover that the vendor itself may be ceding control. An *Insights* column by Stanley Goldman

1129. "Bigger Bang Theory" (Page 64)—Robert G. Cross explains how businesses can squeeze more returns from existing products without downsizing.

ing. An interview by Megan Santos

1130. "Mixed Messages" (Page 72)—results of the seventh annual CIO Magazine/Ernst & Young executive survey. By Jennifer Bresnahan

1131. "Bewitched, Bothered and Bewildered" (Page 82)—integration offers solutions to the software development crisis. A *Gartner View* column by Brendan Conway and Richard Hunter

1132. "Getting There From Here" (Page 92)—new technologies transfer information seamlessly back and forth between paper and digital formats. A *State of the Art* column by John Edwards

1133. "A Hire Standard" (Page 100)—when Stratus Computer discovered its staffing metrics lagged behind the competition, the company turned to client/server. A *Working Smart* column by Katherine Aner

JUNE 1, 1996

1134. "Five Uneasy Pieces, Part 2" (Page 34)—while it's true that many companies have reaped great rewards from their investments in knowledge management, outsourcing, customer satisfaction, benchmarking and organizational learning, success requires knowing where the dangers lie.

1135. "Mastering the Possibilities" (Page 52)—in just five months, MasterCard delivered a data warehouse so that member banks could gain access to data on cardholders' buying patterns. By Tracy Mayor

1136. "Moving the Goods" (Page 62)—logistics once had a simple formula: Manufacture products in long runs and move large quantities in as few shipments as possible. Today it's not so simple. By Peter Fabris

1137. "Light at the End of the Chunnel" (Page 74)—The Franco-British IS crew for the English Channel's Eurotunnel is hard at work on a three-year system reconstruction project. A *European Spotlight* feature by Marsha W. Johnston

1138. "Finding the Information that Matters" (Page 24)—knowing the most important piece of

information in your company can save you megabucks in consulting fees. A *Think Tank* column by Tom Davenport

1139. "CIOs at the Cybercrossroads" (Page 28)—when technology and business intersect on the information highway, it's likely to be the CIO who ends up directing traffic. A *Reporter's Notebook* column by Anne Stuart and Cheryl Dable

1140. "The Coffee Connection" (Page 84)—can Java supply the jolt organizations need to make truly distributed, networked computing a reality? A *State of the Art* column by Dennis Hamilton

1141. "A Coordinated Campaign" (Page 96)—Harvard University developed a client/server-based system that coordinates decentralized fund-raising activities. A *Working Smart* column by Katherine Aner

JUNE 15, 1996

Special Focus: SAP Software

1142. "Ready or Not" (Page 34)—CIOs worry that installing SAP software will blow their budgets—and their careers—to smithereens. But does the problem lie in the software? By E.B. Baatz

1143. "Flipping the Switch" (Page 43)—what's the best way to restructure your company's processes? Three companies take different approaches to implementing SAP. By Christopher Koch

1144. "Banks on Balance" (Page 70)—retail banking is moving out from behind marble counters and glass teller cages into a customer-driven future of made-to-order financial products and swifter service. By Mickey Williamson

1145. "The Enemy Within" (Page 84)—security isn't just an Internet issue. Corporations must figure out how to protect themselves from the inside out. By Anne Knowles

1146. "Six Months in Review" (Page 94)—an index of all major articles published in CIO and WebMaster in the first six months of 1996, including a cross-reference by article type.

1147. "Watch Your Assets" (Page 28)—an asset inventory can supply a basis for drafting

budgets, implementing upgrades and supporting users better. An *Insights* column by Joe Caston

1148. "Stopping the Budgeting Black Hole" (Page 102)—spending for PC LANs these days can become the black hole in the IS budget. A *Gartner View* column by Dave Cappuccio and Bill Kirwin

1149. "Custom-Tailoring" (Page 112)—customer needs are driving IS priorities like never before, according to the ninth annual CSC survey of critical IS issues. An *Outlook* column by Robert Savoia

JULY 1996

Special Issue: IT in Government

1150. "Public-Address Systems" (Page 30)—public sector information systems are advancing the centuries-old quest to form a more perfect union. By Peter Fabris

1151. "Rethinking the way Government Works" (Page 36)—U.S. government at every level is focusing on how IT can bring about reform. By Mickey Williamson

1152. "IS G-men" (Page 50)—public sector CIOs play an important role in the transformation of federal, state and local government. By Peter Fabris

1153. "Unusual Suspects" (Page 68)—federal agencies have something to teach their corporate counterparts. By Megan Santos

1154. "Phoenix Rising" (Page 88)—the process that brought IT to this desert city was not as cloudless as its weather. By Tom Field

1155. "No Cover, No Minimum" (Page 26)—CIOs in public ser-



On the one hand, you need cable.
On the other hand, it better be
reliable.

Need a hand?



Nathaniel Stathum and
the team at Bell Labs
are ready to lend a hand.

SYSTIMAX® Structured Cabling Systems are one of the most proven premises network backbones in the world. Our fiber optic, copper, and wireless solutions exceed industry (TIA/EIA) standards. Real world testing, with real applications, helps prevent costly down time. Bell Labs innovations. Global installation and support. Unsurpassed 15-year Warranty. When would you like us to start?

CONSULTING
INFRASTRUCTURE
SOFTWARE
RISK SHARING
SERVICE

Lucent Technologies
Bell Labs Innovations
283 King George Road
Warren, NJ 07059
1-800-344-0223 ext.6069
<http://www.lucent.com>
We make the things that make communications work™

STORY INDEX

vice may ensure that IT will be the cutting edge of social progress. By Gary Chapman

1156. "A Sure, Secure Thing" (Page 106)—Internet security tools are hitting the market at a remarkable pace, but finding the best tool for your organization takes time. By John Edwards

1157. "Red Light District" (Page 116)—New York turns to client/server technology to catch traffic-signal scofflaws. By Heath Row

AUGUST 1996

Special Issue: The CIO-100 World Leaders

1158. "The Global Imperative" (Page 34)—CIO honors 100 corporate citizens of the world. By Anne Stuart

1159. "Going for More of the Same" (Page 44)—global manufacturers tailor products to fit local markets but incustomize processes to function efficiently. By Tom Field

1160. "Mandate to Innovate" (Page 54)—in high-tech manufacturing, dominating world markets takes more than producing easily adaptable products. By Alice Dragoon

1161. "Madmen Across the Waters" (Page 68)—for process manufacturers, management sanity depends on enterprise resource planning. By E.B. Baatz



1162. "No Secret to Service" (Page 80)—service leaders succeed by knowing who wants a particular product, where the customers are and how much change the product can take. By Carol Hildebrand

1163. "Money Makes the World Go Around" (Page 90)—finance

honorees triumph over changing cultures, communications and currencies. By Christopher Koch

1164. "As the World Shrinks" (Page 100)—how to manage when the whole world is your office. By Anne Stuart

1165. "Meet the Judges" (Page 128)—a panel of global experts lent their time and insight to choose among the best companies in the world.

1166. "1996 Index of Articles" (Page 134)—an index of all major articles published in CIO and WebMaster in the first eight months of 1996, including a cross-reference by article type.

SEPTEMBER 1, 1996

1167. "Shipping Out" (Page 44)—offshore software development isn't without risks, but going with offshore outsourcing projects can deliver high-quality, low-cost work. By Lynda Radosevich

1168. "Triple Replay" (Page 60)—three organizations review their sometimes bumpy migration to client/server systems. By Peter Fabris

1169. "Thick and Thin of IT" (Page 72)—partitioning applications for client/server environments is a complex but rewarding goal. By Joe Mullich

1170. "Rocket Science" (Page 84)—a profile of Hughes Electronics and its changing business strategy and use of IS. By Derek Slater

1171. "Full-Circle Scrutiny" (Page 30)—360-degree surveys and other gap analysis tools can promote better service from a company's own support departments. An Insights column by Lawrence Serven

1172. "Get the Picture?" (Page 36)—a Gartner Group study of leading users brings videoconferencing best practices into focus. A Gartner View column by Al Lill

1173. "Further Discussions" (Page 102)—excerpts from CIO's first online feature forum on implementing SAP enterprise resource planning software.

1174. "Nowhere to Hide" (Page 106)—promising wireless technologies are ready to put your

LAN, e-mail and most of the Internet in your pocket. A State of the Art column by John Edwards

SEPTEMBER 15, 1996

1175. "Pitching Change" (Page 40)—a new CIO and a revitalized information services department lead a cultural shift in conglomerate Delaware North. By Carol Hildebrand



1176. "Will Your Systems Survive the Year 2000?" (Page 52)—a computer-clock time bomb is set to go off at midnight, Dec. 31, 1999. CIOs on the road to conversion explain how to survive. By Miryam Williamson

1177. "Covering New Territory" (Page 66)—developed to make sales reps more efficient, sales technology has changed not just the sales process but the entire enterprise focus. By Tom Field

1178. "Beating a Bad Gap" (Page 28)—Find out what the business really thinks of IS. An Executive Counsel column by Christopher Koch

1179. "We Have the Techknowledge" (Page 36)—discover which of the latest knowledge-oriented technologies is right for your company. A Think Tank column by Tom Davenport

1180. "Intranet Telephony" (Page 76)—will your LAN replace your PBX? An Emerging Technology column by Fred Hapgood

1181. "Citicorp's Colin Crook" (Page 88)—changing technology and the 21st-century enterprise. A Shop Talk column by John Whitmarsh

OCTOBER 1, 1996

Special Issue: Data Warehousing

1182. "What's It All About?" (Page 28)—an introductory overview of data warehouses and the issues to consider before implementing them. By Carol Hildebrand

1183. "Charting a Course" (Page 46)—for many companies, plotting the growth and integration of discrete data marts must be weighed against taking a one-time plunge into an enterprise-wide warehouse. By Jennifer Bresnahan

1184. "Views You Can Use" (Page 60)—CIOs intent on making data warehousing investments pay off must understand the user psyche. By Carol Hildebrand

1185. "What's It Worth?" (Page 78)—experts from the telecommunications, government, insurance and health-care sectors explore the benefits of data warehousing. By E.B. Baatz

1186. "Just Browsing, Thanks" (Page 98)—Web access to a data warehouse is tempting, but uncertainties of the Internet call for caution before opening the store to all comers. By Heath Row

1187. "Digesting the ROI Paradox" (Page 32)—ROI figures are crucial—unless the new IT initiative is the boss's idea. A Metric Systems column by E.B. Baatz



1188. "Buried Treasure" (Page 38)—some dos and don'ts of data mining. A Gartner View column by Erick Brethenoux

1189. "Data Scrubbing" (Page 108)—new tools provide better ways to clean databases. An Emerging Technology column by John Edwards

NEC Technologies Inc.

PowerMate Pro 2200



NEC Technologies' DMI-enabled PowerMate Pro 2200 (\$3,471 street), one of our Editors' Choice winners, has the features, performance, and comprehensive support programs to make it a great choice for corporate use. The unit is a mainstream corporate system targeted for use in financial, engineering, and software development departments. NEC includes numerous hardware and software features, such as network and system management tools, to reduce the cost of ownership and maximize system performance and security. NEC recently merged with Packard Bell to form Packard Bell NEC. NEC will continue to design and oversee the manufacturing of all of its PowerMate commercial desktop systems.

The PowerMate Pro system's tool-free mini-tower case holds an Intel motherboard with the Natoma chip set. To this NEC adds an IBM 2GB 5,400-rpm EIDE hard disk, a Matrox Millennium graphics card with 4MB of WRAM, and an NEC 8X MultiSpin 8V CD-ROM drive. The NEC MultiSync M700 monitor with integrated speakers is DCC-1 and DCC-2 compliant.

On most of our tests, the unit kept pace with the competition well, posting a score on our Winstone 32 tests that was at the high end of the average range. The unit also had average scores on the AutoCAD and C++ tests.

The PowerMate Pro supports DMI, and a MIF browser is available (although one was not sent for this roundup). Also included were MacAfee's VirusScan for NT, Intel's LanDesk and HealthMeter, CyberMedia's First Aid 95, and MagicEye security technology. MagicEye is a combination of hardware and software that detects and reports when the system is opened; it also monitors system temperature, voltages, and fan speeds. The unit also features an IrDA-compliant, 115.2-Kbps infrared interface, which you can put to work with the included copy of Puma's TranXit.

NEC covers this line with a three-year warranty; on-site service is free for the first year. On-site coverage for two more years costs \$99. Augmenting its round-the-clock technical support, NEC has dedicated toll-free support lines for corporate customers, who are routed immediately to PowerMate technical-support specialists. Other service and support programs for corporate customers are available.—BB

PowerMate Pro 2200. Street price: \$3,471. NEC Technologies Inc., Boxborough, MA; 800-632-4636, 508-264-8000; fax, 800-366-0476; www.nec.com. Circle 470 on reader service card.



IN MOVIES, IT'S THE OSCAR.
IN TV, IT'S THE EMMY.
IN MUSIC, IT'S THE GRAMMY.
IN OUR LINE OF BUSINESS,
IT'S THIS PIECE OF PAPER.



In a recent issue of *PC Magazine*, the NEC PowerMate® system won the Editors' Choice Award for Pentium® Pro processor-based PCs. In categories that included features, performance, support and price, we outclassed IBM, Compaq and Dell. For more information, call 1-800-NEC-INFO. Or visit our web site at <http://www.nec.com>. Better yet, simply read what the editors of *PC Magazine* wrote. SEE, HEAR AND FEEL THE DIFFERENCE.™

NEC

STORY INDEX

1190. "Grand Circle Travel" (Page 124)—when marketers were given access to data, sales went up, costs went down and IS had time for other projects. A Working Smart column by Megan Santosous

OCTOBER 15, 1996

1191. "Mission Possible" (Page 54)—the exponential rate of change in technology makes keeping up seem unachievable. But some companies have developed strategies to stay ahead of the curve. By Jennifer Bresnahan

1192. "Proceeding With Caution" (Page 68)—to heal its ailing legacy system, Standard & Poor's built a customized client/server architecture and pulled the plug on its mainframe. By Tracy Mayor

1193. "Dream Team" (Page 78)—among the IT professionals on today's development teams are people you might not expect to find: psychologists, social scientists and, of all things, users. By Miryam Williamson

1194. "The Virtual Water Cooler" (Page 90)—smart management will mean the difference between a virtual workgroup that falls short and one that gets results. An Interview with Jaclyn Kostner by Peter Fabris

1195. "The Stuff Dream Jobs Are Made Of" (Page 38)—retaining IS staff requires more than just attractive pay and a few pats on the back. An Executive Counsel column by Cheryl Dahle

1196. "Joining the Culture Club" (Page 48)—to understand employees' behavior, ask the behavior experts. A Think Tank column by Tom Davenport

1197. "Server Software Suites" (Page 96)—BackOffice provides new glue for the enterprise. An Emerging Technology column by Rick Cook

1198. "Acxiom's Alex Dietz" (Page 110)—methods for slashing processing costs. A Shop Talk column by John Whitmarsh

NOVEMBER 1, 1996

Special Report: The CIO Career

1199. "Wanted: Ability to Leap Tall Buildings..." (Page 46)—an



in-depth look at executive turnover and surviving and thriving as a CIO. By Richard Pastore

1200. "Survival of the Fittest" (Page 48)—experienced CIOs offer advice on how to avoid the pitfalls along the IS career path. By Richard Pastore

1201. "The Truth About Turnover" (Page 60)—CIO does not stand for "career is over." Our exclusive research debunks that and other myths about IS executive job longevity. By E.B. Baatz

1202. "When Opportunity Knocks" (Page 70)—a new job can be rife with possibility or peril. But there are ways to minimize the risk. Will you make the right decision? By Richard Pastore

1203. "Making the Grade" (Page 78)—at the University of Missouri, decisions must be made about when and how to institute uniform information systems. A Second Opinions feature by Tom Field

1204. "Our Own Worst Enemy" (Page 28)—change isn't easy—we know from experience. But with any luck, you'll learn from our mistakes. A Change Agent column by Carol Hildebrand

1205. "The New Breed" (Page 38)—to attract and retain the most suitable IS professionals, CIOs need to offer compensation packages that fit today's corporate culture. A Meta View column by David Foote

1206. "Factory Automation" (Page 90)—tools developed for the office are tearing down the traditional barriers between the factory and the rest of the enterprise. An Emerging Technology column by Rick Cook

NOVEMBER 15, 1996

1207. "Sounding the Alarm" (Page 44)—if you want tightly integrated systems that produce a companywide data flow, be careful. You might get just what you asked for. Part one of a three-part feature by Christopher Koch

1208. "The Fruits of Their Labors" (Page 56)—Fruit of the Loom is developing an online distribution channel that lets its competitors include products for free, leaving some to wonder if Fruit has gone bananas. By Lynda Radosevich

1209. "Measure for Measure" (Page 68)—new business metrics are giving CIOs cause to get their numbers up to snuff. By Peter Fabris

1210. "Dynamic Duos" (Page 78)—for CIOs, seconds-in-command can be reliable partners—and sometimes even their best friends. By Heath Row

1211. "The Way You Say It" (Page 34)—when you're trying to get through to the troops, your medium can be as important as your message. An Executive Counsel column by Christopher Koch

1212. "Haiku, Cherry Blossoms, Sushi and...Notes?" (Page 40)—the Japanese can teach us how to mix technology and culture. A Think Tank column by Tom Davenport



1213. "PC Cards" (Page 92)—mobile systems have everything to gain in easy, practical ways. An Emerging Technology column by John Edwards

1214. "The Gap's Mick Connors" (Page 103)—streamlining the global supply chain. A Shop Talk column by John Whitmarsh

DECEMBER 1, 1996

1215. "The Missing Piece" (Page 40)—"consulting skills" are becoming more of a necessity than a nicety for CIOs. By Tom Field

1216. "A Smarter Linking Logic" (Page 54)—message brokering just might be the future of systems integration. Part two of a three-part feature by Christopher Koch

1217. "Proven Returns" (Page 64)—MCI and Prudential have derived substantial business benefits—and cost savings—from message brokering. Part three of a three-part feature by Christopher Koch

1218. "Remodeling Sears" (Page 70)—the country's third-largest retailer is back with new blood at the top and a whole new way of looking at IS. By Daniel Gross

1219. "Automatic Standards" (Page 78)—suppliers to the Big Three automakers must comply with mandatory standards. Their plight could foreshadow what lies ahead for other industries. By Jennifer Bresnahan

1220. "The Year in Review" (Page 88)—an index of all major articles published in CIO in 1996, including a cross-reference by article type.

1221. "Money Mastery" (Page 32)—digging for dollars is a key skill for high-performance CIOs. A Forrester View column by Russ Maney and Julie Horkan Meringer

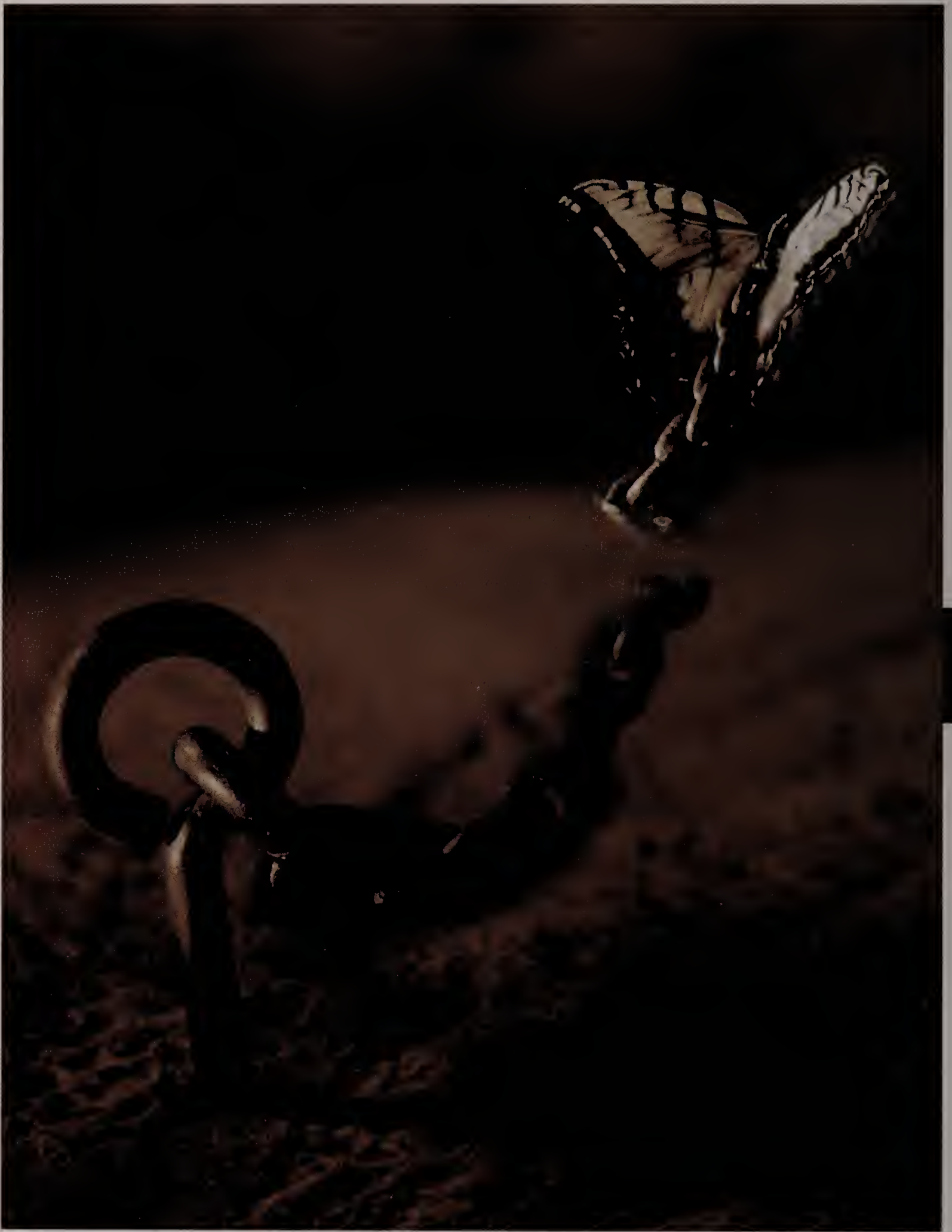
1222. "Year 2000 Further Discussions" (Page 106)—excerpts from CIO's second online feature forum, on the year 2000.

1223. "Groupware Imaging" (Page 110)—groupware and intranet use are changing the image of imaging. An Emerging Technology column by John Edwards

1224. "Michigan Employment Security Commission" (Page 120)—to streamline its unemployment claims process, this employment agency turned to interactive voice response technology. A Working Smart column by Megan Santosous

YOUR RELIANCE ON CONVENTIONAL WORKSTATIONS
IS ABOUT TO CHANGE FOREVER.





© 1996 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. Compaq Professional Workstation is a registered trademark of Compaq Computer Corporation. The Intel Inside Logo and Pentium are registered trademarks and the Pentium Processor Logo and the Pentium Pro Processor Logo are trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. In Canada, we can be reached at 1-800-567-1616.

With all due respect to RISC/UNIX-based systems, we think you'll find our Professional Workstation offers something that's been sorely missing in proprietary workstations. Namely, freedom.

To begin with, you'll have plenty of power to run your specialized applications. This is made possible through a range of cutting-edge performance features. Including Compaq's advanced system architecture which is optimized for Windows® NT and can run up to two Pentium® Pro processors. And because our workstation is based on open systems standards, you'll find it will integrate easily into your distributed



existing network. So instead of having to work within the constraints of a proprietary system, you'll have the flexibility to accommodate your needs, whatever they are. Of course, with Distributed Access, you'll also be assured of a transparent connection to all the information you need throughout your enterprise. Even in RISC/UNIX environments.

Another benefit is the result of our partnerships with leading independent software vendors like Microsoft, SDRC, Autodesk and PTC. Because these solutions have been thoroughly tested, you'll get optimum performance and compatibility.

INTRODUCING THE COMPAQ PROFESSIONAL WORKSTATION.

Finally, our workstation provides a lower cost of ownership—not only through price:performance but also through Compaq's industry-leading management features and comprehensive service and support programs. Including hundreds of resellers specially trained for your market.

All said, the Compaq Professional Workstation is unlike any workstation you've ever used before. Which, of course, is exactly the point. For more information on Compaq workstations or Distributed Access, visit us at www.compaq.com or call 1-800-318-7774.



So what's under the hood? 1-2 200MHz Pentium® Pro processors with NT 4.0, a 256K cache, up to 512MB of ECC DIMM memory, an Ultra-Wide SCSI controller, and advanced 2D/3D graphics accelerators.

COMPAQ

Has It Changed Your Life Yet?

Year 2000 Further Discussions

Excerpts from CIO's second online feature forum

Converting software applications and databases to handle date calculations in the next millennium is a major concern in many IT shops. However, many practitioners are still trying to clear the primary hurdle of getting executive management's attention and landing the necessary funding. To assist in that effort, CIO is sponsoring an online feature forum as a follow-up to a recent article on the topic (see "Will Your Systems Survive the Year 2000?" Sept. 15, 1996).

Participants are discussing the legal and accounting issues, the pros and cons of updating software while converting it, staffing issues and conversion best practices. They have advice on keeping up the morale of programmers saddled with maintenance responsibilities and on getting senior management's buy-in. "What's the worst that could happen?" one participant asked recently. "You could go out of business," another replied.

To give you a flavor of the dialogue, we include here some excerpts from the ongoing interactive session. If you have access to the World Wide Web, you can participate in the forum by pointing your browser to www.cio.com/forums/year2k.html.

Topic Awareness

Raise the overall level of awareness

Although the potential for a financial crisis concerns me, it's the exposures from massively life-threatening systems such as nuclear-power and chemical plants that have me working overtime trying to raise the level of awareness on this issue. Too bad O.J. [Simpson] doesn't own a software company—maybe then the mainstream media would look into this problem.

— Leon A. Kappelman, professor, University of North Texas, and co-chair of the Society for Information Management's Year 2000 Working Group

Response: Get serious

I agree with your concerns and think not enough mainstream press coverage has been given to the problem. If any entity that relies on information technology to do its business (and that's just about everyone I can think of) does not get a serious program staffed and underway by the end of the year, it will be in serious trouble.

— Kathleen M. Adams, associate commissioner for systems design and development, Social Security Administration and head of the U.S. government's Year 2000 Interagency Committee

Response: Arranging deck chairs on the Titanic

With all due respect to the valiant efforts of the IT folks who make their systems year 2000 compliant, we (the People) need to scrutinize the national and global computer infrastructures for likely failures and ensure that they are compliant also.

Today's global economies are so intertwined and interdependent that if there are crashes in systems supporting power utilities, telephone service, money transfers, water supplies, transportation, securities clearance and settlement, and a host of others, it will not matter that an individual company, agency, institution or person has done a great job in making their own systems and networks year 2000 compliant—they won't even be able to operate!

There is a desperate need for our national and global leadership to step up to the plate and manage the full scope of the year 2000 threat. It is up to the People to call our leadership to task.

— C. Warren Axelrod, president, C.W. Axelrod Associates Inc.

Topic Legal Liability

Get the legal department involved as soon as possible

The IMF Year 2000 Group has had two lawyers present

StorageTek

Where the world's information goes.

**Hidden somewhere
in a vast database is
exactly the information
you need.**

How quickly can you find it?



The sheer volume of information it takes to compete in the world keeps growing. How do the world's most successful companies keep their edge? Nearline® storage technology, from StorageTek®. Our Nearline family of high-performance, automated tape library systems is up to twice as fast as other automated systems. They crisscross different environments and operating systems transparently to the user. And their cost per megabyte is a fraction of the cost of disk. For more information, just call **1 800 922-3260, ext. 1205**. Or visit our Web site.

www.storagetek.com/dune

their views on the year 2000 legal issues. The net of those discussions is get your legal department involved as early as possible. Each organization will have its own unique set of legal issues and exposures, but everyone will have some. Litigation surrounding failures from year 2000 related causes is as certain as Dec. 31, 1999.

— Jim Jones, managing director, *The Information Management Forum Year 2000 Group*

Topic Accounting Rules

Consider your organization's accounting principles

In addition to technical and management aspects of the year 2000 project, commercial organizations may have to consider accounting principles when making decisions about including improvements under the year 2000 umbrella. It looks like the year 2000 work will have to be expensed—not capitalized—while system improvements have a better chance for capitalization. Mixing them together may interfere with your company's financial strategy for dealing with IS expenses.

— Miro Medek, lead IS engineer and project manager, *Mitretek*

Response: Article on recording expenses

I just read an article on the subject of U.S. companies having to record their year 2000 expenses in the fiscal quarters in which the work was done; they are not allowed to "spread" the expenses over several years! The writer said that would further hinder the willingness of businesses to tackle the problem because there will be large financial losses recorded against the year 2000 problem in the coming years.

— Peter B. MacIntyre, president, *Beacon Systems*

Topic User-Developed Applications

Should IT shops be talking with those who created user-developed applications?

Some user-developed applications have become an important part of the way departments do business. Do the people who developed them understand the implications of date calculations after Jan. 1, 2000? Should IT shops be talking with them? Helping them convert? Doing it for them?

— Miryam Williamson, contributing editor, *CIO*

Response: User-developed applications—the bad news

You can't afford to ignore user-developed applications. In many cases, they are not only vital to a department or larger organization but often feed IS's systems, whether you know it or not.

You have to do everything possible to get [user-developed applications] involved, up to and including fixing the applications yourself. In addition, that whole task is not an IS venture and may be doomed if you treat it that way. Getting everyone involved helps ensure that the business managers look more favorably on your analysis and requests for funding. Keeping everyone involved requires structured communication.

— Phillip Gordon, systems architect, *Franklin Resources, Inc.*

Topic Updating While Converting

The pros and cons of making functional and technical improvements

Some companies contemplate making functional and technical improvements along with their year 2000 changes. What are the pros and cons of that approach?

— Miryam Williamson

Response: Time is of the essence

There are roughly 520 working days between now and the end of the third quarter of '98, a time at which most applications should be year 2000 compliant.

Trying to add value to the renovation project at this point may well be counterproductive. Reengineering and retooling applications take too long.

Renovation in the simplest way possible is the most likely choice for project managers.

— Thomas D. Oleson, research director, *International Data Corp.*

Response: Value-added approach

We have been taking the value-added approach for some time now. We started migrating slowly toward a new customer file a few years ago. The primary purpose was to better model our business and provide for future expansion, but it also included the year 2000 effort. All new development since that time has addressed year 2000.

Our efforts have been accelerated to ensure that we complete the project prior to Dec. 31, 1998.

I should note that we are also hedging our bets by performing additional impact analyses on year 2000, just in case. I have to admit, though, that there is no way I would recommend that approach to anyone who is just beginning to work on year 2000.

— Terry J. Bennett, vice president and director of business systems architecture, *American Fidelity Assurance Co.*

Topic Morale

How is the conversion affecting programmers' morale?

Maintenance is not usually a programmer's idea of a plum assignment. Do there tend to be morale problems amongst the conversion team? If so, how do you deal with them?

— Miryam Williamson

Response: We've made the year 2000 project a good place to be

Leadership, strong commitment and focus at Chubb have made the year 2000 project one of the good places to be. We feel the sense that what we are doing is critical, not business as usual. We have moved our team off campus, created an environment that is more like a partnership and less like a corporation, and empowered all to act quickly to resolve issues. People respond well to those messages.

— John T. Jung, vice president of systems development and delivery, *Chubb and Son Inc.*

We have no stop-and-go traffic and speeding is always encouraged.



You can't
afford to be
stuck in a jam
when it comes
to sending data.

With Sprint's
bursting advantage,
data bursts get full access to
the top channel speed as needed. That

means your mission-critical data is transmitted
with exceptional speed and efficiency. As
for reliability, we're committed to bringing you
the highest, most reliable data transport in the
industry. We also minimize the worries.

Sprint's self-healing SONET-based
fiber network automatically
reroutes around problems
in milliseconds,

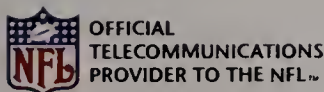
Only Sprint

**frame relay service supports sustained data bursts worldwide
for uninterrupted data delivery—at no extra cost.**

making them
transparent
to you, the cus-
tomer—even in
the event of fiber
cuts or equip-
ment failures. What's
more, we've replaced multiple

private line connections with a single
point of access to simplify network management
and reduce costs. Should you need to expand
or upgrade your frame relay service, we make it
simple with on-call planning and design. And with
20 years of packet switching experience,
you can count on us to ramp up your
data to an open road—
with no red lights and
no speed limits.

Call Sprint Business
1-800-588-DATA
www.sprint.com/data1



We help business do more businessSM

Emerging Technology

THE STATE OF THE ART,
NEW PRODUCTS
AND STAYING AHEAD
OF THE CURVE

Edited by Elaine Cummings

Groupware Imaging

Groupware and intranets are changing the image of imaging

BY JOHN EDWARDS

THESE DAYS, PICTURES CAN have a thousand *uses*, thanks to the union of imaging and groupware technologies. Imaging has been around in one form or another for years, boasting a steadily growing market. The leading imaging technology—document imaging—has long been used by banks, insurance companies and other financial institutions to store digital copies of paper-based letters and forms.

Now groupware, with its ability to manipulate and distribute graphical information, is changing the image of imaging. Traditional imaging is a static technology, offering organizations little more than basic storage and distribution capabilities. But the collaborative nature of groupware promises to transform imaging into a fully interactive process, says Bob Lewin, senior industry analyst for San Jose, Calif., market researcher Dataquest Inc. "The difference is between having users simply look at an image and having them do something to the image," he says.

Basic document imaging simply helped organizations eliminate the expense of storing paper documents.

Groupware, on the other hand, has the potential to make imaging an integral part of an organization's overall business processes, according to Ted Ryrie, vice president of systems integration for ACI, a New York-based consulting firm. "The concept is that imaging shouldn't be a unique, standalone application but something that can be used to enhance a wide range of tasks," he says.



With the latest groupware imaging tools, users can take advantage of a variety of annotation and image manipulation functions, such as using a rubber stamp or sticky notes; viewing images in color or black and white; and shrinking, magnifying or rotating images.

"We've all become visual people," Lewin says. "Imaging is becoming a part of groupware because it's now a part of most other software. It's something that most groupware customers are beginning to expect."

The increasingly graphical world is responsible, at least in part, for an increased interest in imaging-enabled groupware. "People have become accustomed to dealing with images on paper documents as well as the World Wide Web," says Ryrie. "It's only natural that they would also want image support in their groupware."

Steady improvements in networking technology are propelling groupware imaging onto the fast track. Besides the recent arrival of intranets—internal networks that allow organizations to cut both costs and management headaches using Internet technology—enhanced network transmission rates are making it increasingly practical to transmit complex images. "The more bandwidth, the faster you can move images," says Ryrie. "The gradual enhancement of networking technology has been a big plus for imaging."

In addition, the move toward open systems and the interoperability of various networking and image products have helped bring groupware and imaging together,

IN THIS SECTION

3-D Graphics

Visio's Visio Professional

Central Technology's
Voice Express Lite

Pilot's Discovery Server

**"I have better ways for my staff to spend their time than keeping our network up and running
... that's *NETSOLVE'S* job."**



*"I chose **NETSOLVE** to make sure our wide area network is available when we need it. They gave us a service level **GUARANTEE**, router-to-router, or my money back. It's virtually **RISK-FREE**. In fact, most months my network **AVAILABILITY** is greater than **99.9%**."*

At NetSolve, our business is wide area network design, implementation, monitoring and management. It has been for over eight years. Whether your network has 5 remote locations or 500, we'll keep it running reliably, so that you and your staff can focus on more strategic issues.

Keeping a network up and running takes experience, expertise and a strong commitment to service—a commitment that led NetSolve to pioneer the router-to-router availability guarantee. If we don't meet the guaranteed availability level in any month we refund 100% of your management fees for that month!

It's this commitment to service that caused leading companies like Standard Insurance Company, Temple-Inland Forest Products Company, and Fidelity National Title to choose NetSolve to manage their networks.

**Call us today for a
free evaluation and consultation.**



NETSOLVEsm

1-800-NETSOLVE

<http://www.netsolve.net>

Emerging Technology

says Ryrie. More vendors of groupware and imaging software are churning out products that are mutually compatible.

The improved output quality of scanners and other imaging tools is helping convince management that imaging can be useful when integrated with groupware, says Mark Ward, GroupWise product manager in the GroupWare division of Novell Inc. "In the past, people would rather overnight a photocopy than e-mail an image, the quality was that bad," he says. "Today, better and cheaper imaging hardware has made it easier to send an image across the network and attach a note to it, too."

Falling hardware prices have also boosted groupware imaging, according to Ryrie. Until recently the cost of high-resolution scanners and high-capacity storage devices needed to archive image files had restricted imaging technology to organizations with deep pockets and pressing imaging needs. But now more potential users can afford imaging hardware. Ryrie anticipates that hardware prices will fall even more dramatically in the years ahead, and he expects prices to drop 15 to 20 percent on monitors, cards, scanners and storage equipment over the next one or two years. He says groupware is helping to drive imaging out of the domain of mega-enterprises and into the reach of virtually any organization, down to the departmental level.

Groupware imaging is becoming popular in diverse fields. In medicine, for example, it is helping doctors and other health professionals work together to view and analyze X-rays and other health records. Human resources workers are using groupware imaging to track job candidates, archiving resumes annotated by key managers. Other applications include correspondence tracking, distributing interactive catalogs, and collaboration on engineering, architectural and other technical documents.

The sudden interest in groupware imaging hasn't been lost on groupware and imaging software vendors. This year vendors have scrambled to add sophisticated imaging capabilities to their groupware product lines. Lotus

Three To Get Ready

VRML—HTML's 3-D cousin—is virtually ready for prime time

SURE, THREE-DIMENSIONAL graphics look terrific on a Web page. But just try to download one of those bandwidth-busters to your PC using a dial-up connection. You'll notice that the transaction happens at roughly the speed of continental drift. The mind-numbing delay smacks of playing Doom on Valium, and it's one of the main reasons virtual reality modeling language (VRML) has yet to gain mass acceptance in the marketplace.

3-D GRAPHICS

VRML is essentially a 3-D version of hypertext markup language. Browsers from Netscape and Microsoft both offer VRML support, allowing Web users to walk (or fly) through virtual landscapes and cities rather than view a flat page of text. Now the corporate world is starting to look into building VRML spaces where customers can interact with company representatives.

Black Sun Interactive, based in San Francisco, offers tools for adding multiuser chat capabilities to VRML sites. Users are represented in each others' views by avatars, or stylized 3-D characters. The combination of 3-D models and text chat functionality has possible applications for sales and marketing or customer service. "You can answer questions in real time and show people how to walk through a process," says Konstantin Guericke, vice president of sales and marketing at Black Sun. The Atlanta

Braves club has built a 3-D site with Black Sun's tools—creating a virtual stadium called "3-D ChopChat" where fans can chat about their shared mania, exchange virtual business cards, purchase Braves memorabilia and view seating charts within the stadium to help make ticket-buying decisions (for information, visit www.atlantabraves.com).

But because of bandwidth issues, corporate intranets may be a more fertile ground for the time being, because intranet users typically use a direct LAN instead of a dial-up connection. For example, NationsBank in Charlotte, N.C., is building a risk management application that lets loan portfolio managers base their assessments on 3-D graphs rather than pages of complex spreadsheets. NationsBank's visualization projects are built using Discovery, a toolset from Toronto-based Visible Decisions Inc. The Distributed Discovery module can generate real-time graphs in VRML, allowing anyone on the corporate intranet to view the data.

"3-D data visualization kind of does for the mind what ergonomics does for the body," says Bryan McNeely, a vice president at the bank. "It's more natural for the mind than looking at data in textual format." There are still some kinks to work out in implementing the VRML distribution model, but McNeely is optimistic that visualization applications will proliferate at NationsBank. Other possible uses include market segmentation and data mining analysis, he says.

—Derek Slater



PHOTO: FPG INTERNATIONAL

IT

IS ABOUT LEVERAGING OPPORTUNITY.

IT can be the balance of power, letting you seize big opportunities and make the most of them. BDM can show you how with IT solutions that help enterprises of all kinds meet challenges of every dimension, from main-frame migration to intranet integration.

Let BDM help you leverage and optimize your opportunities now.

BDM®

The Information Technology Company



1501 BDM Way • McLean • Virginia • 22102
Email: bdmit@bdm.com • Internet: <http://www.bdm.com>

© 1996 BDM International, Inc. All rights reserved.

Emerging Technology

Development Corp. has offered baseline imaging distribution and viewing functions for its Lotus Notes groupware line for several years, but the IBM subsidiary recently increased its focus on groupware imaging. In April, the company introduced Lotus Notes to IBM ImagePlus Connection, a link to ImagePlus, IBM's document imaging application. ImagePlus lets organizations store and manage digitized images of letters, records and other documents, while ImagePlus Connection allows users to transfer graphical information between Notes and ImagePlus. The linking software connects client/server and intranet Notes users to ImagePlus library servers and supports on-site workers and remote users through mobile dial-up connections.

Susan Ryan, Lotus's senior marketing manager for multimedia products, says her company views imaging as a core Notes component. "Imaging will grow in importance in the years ahead," she says.

Novell is also working to add imaging functions to its groupware line. In September, the company joined a pair of imaging specialists—Xerox Desktop Document Systems and WhetStone Technologies—to bring groupware imaging to its GroupWise family. Novell's Imaging Solutions Pack draws on the capabilities of Novell's Envoy portable document technology, Xerox's PerfectScan image editing system, TextBridge optical recognition software, and WhetStone's ViewWise image viewer and production imaging system. The Imaging Solutions Pack offers GroupWise users a set of image capturing, scanning, editing and conversion features.

Imaging support is poised to become a key component in the company's groupware line, says Novell's Ward. "We think sophisticated imaging is something our customers will come to expect in the years ahead," he says.

Microsoft Corp., finding itself in a catch-up situation, is taking steps to provide its Microsoft Exchange software with imaging capabilities. The company is working with Wang Laboratories Inc. to ship a low-end imaging add-on by the end of this year. The product will include basic scanning, viewing, annotating, image manipulation and printing functions. Microsoft also recently increased the file size limit on its Exchange application so that users can send large image files.

Ryan compares the current groupware imaging market with the word processing market of 10 years ago. "Back then, you had to buy different add-ons, such as a spelling checker and a thesaurus, in order to get a complete word processing product," she says. "Right now, it's sort of the same way with groupware and imaging, with customers having to seek out imaging add-ons. But the market is

LEADING

EDGE

Go With the Flow

WHO ISN'T LOOKING FOR A BETTER way to improve business practices, implement reengineering programs and enhance their Web site design and documentation? **Visio Professional**, the latest addition to Seattle-based Visio Corp.'s line of enterprise drawing and diagramming applications, Visio and Visio Technical, is the first to target IS and business-process management markets. It provides



specialized features for network design, workflow, technology planning, and software and database development as well as the standard diagramming functions of the company's Visio product. It also includes a Web site Diagramming Wizard that generates a hierarchical diagram of the site's pages and links based on formatting preferences gathered from the user.

In addition, Visio's Business Modeler, an add-on for the software program, can help expedite implementations of the SAP R/3 system to enable everyone in the organization to master continuous business redesign efforts.

Visio Professional works with Windows 95 or Windows NT. The cost is estimated at around \$350, but the Visio and Visio Technical products can be upgraded for less. For more information, call 206 521-4500 or visit www.visio.com.

Mail Carriers

CENTRAL TECHNOLOGIES INC., based in Moorpark, Calif., has just introduced **Voice Express Lite**, an entry-level version of its flagship Voice Express voice mail and automated attendant system.

Voice Express Lite is a PC-based software package for multiline voice mail with an automated attendant and fax-on-demand functions. It can handle up to 32 phone lines and up to eight fax lines simultaneously and provides pager notification, automatic messaging and purging, and unlimited voice mailboxes and fax-on-demand documents. Mailbox messages can be retrieved from either the PC or any touch-tone phone.

Voice Express Lite can be upgraded easily to Voice Express Professional, which includes call screening, call queuing, automatic call distribution groups, multiple pagers, enhanced remote mailbox owner functions, wake-up call functions, and a unique "talking Yellow Pages" search function.

Voice Express Lite starts at \$595 and Voice Express Professional starts at \$1,095; both include a two-line voice board and software. For additional information, call 800 532-8053 or check out www.centraltech.com.



ILLUSTRATION BY ROBIN ZINGONE

Information
promises.

Knowledge delivers.



Information has no value until it meets a specific need.

Knowledge solves problems and knowledge answers questions.

Knowledge is information mined for context and meaning.

Knowledge is the new currency of enterprise-wide success.

Excalibur RetrievalWare extracts knowledge from stored, accumulated information.

Precisely. Directly. In seconds, on your desktop.

Excalibur RetrievalWare. Transforming Information Into Knowledge.

Transform information into knowledge NOW.

<http://www.excalib.com/cio/>



1 • 8 0 0 • 7 8 8 • 7 7 5 8

Emerging Technology

gradually maturing," Ryan adds.

David Coleman, managing director of Collaborative Strategies, a San Francisco-based groupware consulting and research firm, warns that potential adopters should tread carefully. "Unless one has a specific, immediate need to get into the area, I would suggest waiting to see how things pan out," he says. According to Coleman, groupware and imaging vendors are engaged in a "next on the bandwagon" race that has them adding groupware imaging capabilities to their products

even before a clear market need arises. "While the vendors can't afford to be without groupware imaging capabilities for strategic reasons, most potential adopters can easily sit on the sidelines and wait for the market to mature," he says.

Coleman suggests that for most organizations, conventional conferencing technologies such as whiteboards offer a higher degree of visual interactivity than current groupware imaging products. "The question is whether you're looking to give users image

access or collaborative capabilities," he says. "A whiteboard offers a better way of sharing ideas visually. Unless you need to have several people working on a highly accurate representation of a particular image, you really don't need groupware imaging for visual collaboration."

But groupware imaging can complement whiteboards and other desktop conferencing technologies, counters Novell's Ward. "Desktop conferencing will allow users to sketch out their own ideas, but a whiteboard isn't going to let you view and comment on an image of an X-ray or correspondence," he says.

ACI's Ryrie notes that organizations thinking about adding groupware imaging to an intranet may be surprised by the technology's relatively low cost. "When you're talking about putting groupware imaging on an intranet, you're talking about a generally modest financial investment," he says. By switching to groupware-based imaging tools on an intranet, he says, organizations can shave costs by sidestepping expensive, proprietary LAN development and management products.

Yet bandwidth woes can put a crimp in any organization's intranet groupware imaging plans, warns Dataquest's Lewin. "People are still finding themselves frustrated by just trying to send text over intranets, much less images," he says. Despite the higher cost, Lewin feels that high-speed client/server networks remain the preferred technology for organizations that plan to make extensive use of groupware imaging. "Intranets offer potential for imaging but just aren't quite there yet," he says.

But Lewin forecasts a generally bright outlook for groupware imaging. "It's hard to see a future in which imaging

"When you're talking about putting groupware imaging on an intranet, you're talking about a generally modest financial investment."

—Ted Ryrie

LEADING

EDGE

Thar's Gold in Them Thar Tools

SALES AND MARKETING FOLKS are some of the best targets for data mining vendors, so it's not surprising that a number of companies rolled out mining tools aimed at just that market subset. Pilot Software Inc. was one of the first off the mark when it announced **Pilot Discovery Server**, a data-mining product designed specifically for sales and marketing executives.

Discovery Server, part of Pilot's Decision Support Suite, integrates directly with existing relational databases to create target marketing programs using exhaustive analysis of customer activity and demographics. By plugging directly into the database, users can work more easily with rows, columns and tables in the database without requiring a data extract. In addition, the Discovery Server includes a marketing intelligence library, which uses marketing and segmentation analysis tools to portray mining results graphically, a format that's more easily understood by users not versed in statistics and advanced analytical tools. Marketing and sales execu-

tives can use the results to focus market segmentation and plan future efforts based on numbers drawn from company data, not thin air.

Discovery Server runs on Windows NT connecting to Microsoft Corp.'s SQL Server and HP-Unix 10 connecting



to Oracle7. Prices, which include software, training and consulting, start at \$100,000. For more information, call the Cambridge, Mass.-based Pilot Software at 617 374-9400 or check out www.pilotsw.com.

Correction: Ameritech's MobilePartner mobile-office starter kit, mentioned in Emerging Technology on Page 82 of the Sept. 15, 1996, issue of *CIO*, includes only the modem and direct-connect cable to hook up a cellular phone or laptop.

doesn't play a role in groupware," he says. Novell's Ward concurs, noting that most organizations and users are just beginning to appreciate the power of e-mail, and groupware imaging will require a few more years to enter the mainstream. "As more people begin to recognize groupware's potential and start to collaborate with others over their PCs, we'll see imaging come to play an increasingly important role in daily business activities," he says. **CIO**

John Edwards is a freelance writer based in Mt. Laurel, N.J. He can be reached by e-mail at 70007.412@compuserve.com.

ILLUSTRATION BY ROBIN ZINGONE

http://www.cio.com

CIO Online and WebMaster Online Are Only The Beginning...

IN-DEPTH INFORMATION RESOURCES

Executive Programs: Educational and networking opportunities for corporate and government executives

Executive Library & Resource Center:

A collection of information for CIOs on career advancement and other work-related issues

Intranet Resource Center: Case studies, articles, reports, seminars and links pertaining to Intranet development and strategy

INTERACTIVE FORUMS FOR THE EXECUTIVE COMMUNITY

Interactive Article Forums: Selected articles in *CIO* Magazine will continue on the Web as interactive discussion forums

The Executive Meeting Place: Network and interact with peers, *CIO* writers, and experts in the field of information management by starting a thread or jumping into an ongoing discussion

QUICK REFERENCE ITEMS

LinkMaster: The ultimate directory for managers and executives, containing links to a wide variety of subjects and resources

WebMaster's Notebook: A rich collection of online seminars, notes and links to sites of interest to Web managers and developers



Drop On In



CIO COMMUNICATIONS, INC.



INDEX

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

Company Index

ACI	110
Advanced Manufacturing Research	78
Aetna International Inc.	20
Agway Inc.	32
Amdahl Corp.	32
American Management Association	40
American Red Cross, The	32
American Society for Quality Control	78
Black Sun Interactive	110
Business Technology Consulting Inc.	40
Central Technologies Inc.	110
Chick-fil-A Inc.	40
Chrysler Corp.	78
Collaborative Strategies	110
CompuAdd Computer Corp.	70
Coopers & Lybrand LLP	20
Cuyahoga Community College	78
Dataquest Inc.	110
David Butler Associates Inc.	78
DCMS Inc.	54, 64
Deskercise International Inc.	20
Ernst & Young LLP	40, 78
Excel Communications Inc.	20
Ford Motor Co.	78
Forrester Research Inc.	32, 54
Fruit of the Loom	32
Gartner Group Inc.	54
General Motors Corp.	78
Halbrecht Lieberman Associates Inc.	40
Hewlett-Packard Co.	40
HLC Internet Inc.	32
IBM Corp.	70, 120
Ichikoh Manufacturing Inc.	78
Informix Software Inc.	70
Intelligent Electronics Inc.	20
Interim Technology	40
Jamesway Transportation Co.	70
Libbey Inc.	20
L.L. Bean	32
Lotus Development Corp.	110
Loxa Corp.	20
Market Central Inc.	20
MCI Telecommunications Corp.	54, 64
McKinsey & Co.	54
Metal Seal & Products Inc.	78
Michigan Employment Security Commission	120
Microsoft Corp.	110
NationsBank	110
New Mexico State University	20
Novell Inc.	110
Peripherals Corp.	120
Pilot Software Inc.	110

Price Waterhouse	70
Pro-Tech Coding Co.	78
Prudential Corp. Australia Ltd.	64
Purdue University	20
Quality Systems International Inc.	78
R.R. Donnelley & Sons Co.	32
Reader's Digest Association Inc.	40
Reality Interactive Inc.	78
Saks Fifth Avenue	70
Sears, Roebuck and Co.	20, 70
Shell Services Co.	32
Society for Information Management	40
Symmetrix Inc.	40
Systems Development Inc.	20
Texas Instruments	32
Textron Inc.	32
Thiokol Corp.	32
TravelNet Inc.	20
UT Automotive	78
Visio Corp.	110
Watchful Shepherd USA	20

Advertiser Index

ADP Inc.	35
AMP Inc.	59
AT&T	19, 117
Amdahl Corp.	11
Ascend Communications Inc.	21
Bay Networks	85
BDM International Inc.	113
Cabletron Systems Inc.	4
Ciber Consulting Inc.	94
CIO Communications Inc.	44, 76, 117
Cognos Inc.	90
CommVault Systems	33
Compaq Computer Corp.	24, 103, 104
Computer Associates Intl. Inc.	4
Data General Corp.	69
Dell Computer Corp.	16, 80
Digital Equipment Corp.	29
EDS Corp.	75
Entex Information Services Inc.	43
Excalibur Technologies	115
FTP Software	87
IBM Corp.	15, 37, 61, 91
Inacom Corp.	50
Inference Corp.	83
Intel Corp.	2
LBMS Inc.	96
Lucent Technologies	99
MCI Communications Corp.	67
Megasoft	77
Microsoft Corp.	3, 12
NEC	52, 101
NetSolve Inc.	111
On Technology Corp.	57, 119
Open Market Inc.	30
Peoplesoft Inc.	65
SAS Institute Inc.	23
Sequent Computer Systems Inc.	9
Sprint	109
Storage Technology Corp.	107
Sun Microsystems Inc.	47, 49, 89
Sybase Inc.	27
3Com Corp.	6
Unisys Corp.	2
Vanstar Corp.	92

CIO is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 275 computer publications in over 75 countries. Sixty million people read one or more International Data Group publications each month. International Data Group's publications include: **Argentina:** Buyer's Guide, Computerworld Argentina, PC World Argentina; **Australia:** Australian Macworld, Australian PC World, Australian Reseller News, Computerworld, IT Casebook, Network World, Publish, Webmaster; **Austria:** Computerwelt Österreich, Networks Austria, PC Tip Austria; **Bangladesh:** PC World Bangladesh; **Belarus:** PC World Belarus; **Belgium:** Data News; **Brazil:** Anuário de Informática, Computerworld, Connections, Macworld, PC Player, PC World, Publish, Reseller News, Supergamepower; **Bulgaria:** Computerworld Bulgaria, Network World Bulgaria, PC & Macworld Bulgaria; **Canada:** CIO Canada, Client/Server World, ComputerWorld Canada, InfoWorld Canada, NetworkWorld Canada, WebWorld; **Chile:** Computerworld Chile, PC World Chile; **Colombia:** Computerworld Colombia, PC World Colombia; **Costa Rica:** PC World Centro America; **The Czech and Slovak Republics:** Computerworld Czechoslovakia, Macworld Czech Republic, PC World Czechoslovakia; **Denmark:** Communications World Denmark, Computerworld Denmark, Macworld Denmark, PC World Denmark, Techworld Denmark; **Dominican Republic:** PC World Republica Dominicana; **Ecuador:** PC World Ecuador; **Egypt:** Computerworld Middle East, PC World Middle East; **El Salvador:** PC World Centro America; **Finland:** MikroPC, Tietoverkko, Tietoviikko; **France:** Distributique, Hebdo, Info PC, Le Monde Informatique, Macworld, Reseaux & Telecoms, WebMaster France; **Germany:** Computer Partner, Computerwoche, Computerwoche Extra, Computerwoche FOCUS, Global Online, Macwelt, PC Welt; **Greece:** Amiga Computing, GamePro Greece, Multimedia World; **Guatemala:** PC World Centro America; **Honduras:** PC World Centro America; **Hong Kong:** Computerworld Hong Kong, PC World Hong Kong, Publish in Asia; **Hungary:** A8CD CD-ROM, Computerworld Szamitastechnika, Internetto Online Magazine, PC World Hungary, PC-X Magazin Hungary; **Iceland:** Tolvheimur PC World Island; **India:** Information Communications World, Information Systems Computerworld, PC World India, Publish in Asia; **Indonesia:** InfoKomputer PC World, Komputek Computerworld, Publish in Asia; **Ireland:** ComputerScope, PC Live!; **Israel:** Macworld Israel, People & Computers/Computerworld; **Italy:** Computerworld Italia, Macworld Italia, Networking Italia, PC World Italia; **Japan:** DTP World, Macworld Japan, Nikkei Personal Computing, OS/2 World Japan, SunWorld Japan, Windows NT World, Windows World Japan; **Kenya:** PC World East African; **Korea:** Hi-Tech Information, Macworld Korea, PC World Korea; **Macedonia:** PC World Macedonia; **Malaysia:** Computerworld Malaysia, PC World Malaysia, Publish in Asia; **Malta:** PC World Malta; **Mexico:** Computerworld Mexico, PC World Mexico; **Myanmar:** PC World Myanmar; **Netherlands:** Computer! Totaal, LAN Internetworking Magazine, LAN World Buyers Guide, Net, Macworld Netherlands, WebWorld; **New Zealand:** Absolute Beginners Guide and Plain & Simple Series, Computer Buyer, Computer Industry Directory, Computerworld New Zealand, MT8, Network World, PC World New Zealand; **Nicaragua:** PC World Centro America; **Norway:** Computerworld Norge, CW Rapport, Datamagasinet, Financial Rapport, Kursguide Norge, Macworld Norge, Multimediaworld World Norway, PC World Ekspress Norge, PC World Nettverk, PC World Norge, PC World ProduktGuide Norge; **Pakistan:** Computerworld Pakistan; **Panama:** PC World Panama; **People's Republic of China:** China Computer Users, China Computerworld, China InfoWorld, China Telecom World Weekly, Computer & Communication, Electronic Design China, Electronics Today, Electronics Weekly, Game Software, PC World China, Popular Computer Week, Software Weekly, Software World, Telecom World; **Peru:** Computerworld Peru, PC World Profesional Peru, PC World SoHo Peru; **Philippines:** Click!, Computerworld Philippines, PC World Philippines, Publish in Asia; **Poland:** Computerworld Poland, Computerworld Special Report Poland, Cyber, Macworld Poland, Network Poland, PC World Komputer; **Portugal:** Cerebro/PC World, Computerworld/Correio Informático, Dealer World Portugal, Mac*In/PC*In Portugal, Multimedia World; **Puerto Rico:** PC World Puerto Rico; **Romania:** Computerworld Romania, PC World Romania, Telecom Romania; **Russia:** Computerworld Russia, Mir PK, Publish, Seti; **Singapore:** Computerworld Singapore, PC World Singapore, Publish in Asia; **Slovenia:** Monitor; **South Africa:** Computing SA, Network World SA, Software World SA; **Spain:** Comunicaciones World España, Computerworld España, Dealer World España, Macworld España, PC World España; **Sri Lanka:** Infolink PC World; **Sweden:** CAP&Design, Computer Sweden, Corporate Computing Sweden, Internetwork Sweden, it-branschen, Macworld Sweden, MaxiData Sweden, MikroDatorn, Nätverk & Kommunikation, PC World Sweden, PC/Aktiv, Windows World Sweden; **Switzerland:** Computerworld Schweiz, Macworld Schweiz, Pctip; **Taiwan:** Computerworld Taiwan, Macworld Taiwan, NEW VISION/Publish, PC World Taiwan, Windows World Taiwan; **Thailand:** Publish in Asia, Thai Computerworld; **Turkey:** Computerworld Türkiye, Macworld Türkiye, Network World Türkiye, PC World Türkiye; **Ukraine:** Computerworld Kiev, Multimedia World Ukraine, PC World Ukraine; **United Kingdom:** Acorn User UK, Amiga Action UK, Amiga Computing UK, Apple Talk UK, Computing, Macworld, Parents and Computers UK, PC Advisor, PC Home, PSX Pro, The WEB; **United States:** Cable in the Classroom, CIO Magazine, Computerworld, DOS World, Federal Computer Week, GamePro Magazine, InfoWorld, I-Way, Macworld, Network World, PC Games, PC World, Publish, Video Event, THE WEB Magazine, and WebMaster; online webzines JavaWorld, NetscapeWorld, and SunWorld Online; **Uruguay:** InfoWorld Uruguay; **Venezuela:** Computerworld Venezuela, PC World Venezuela; and **Vietnam:** PC World Vietnam.

Editorial, Advertising and Business Offices: 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208, (508) 872-0080. **Postal Information:** CIO (ISSN 0894-9301) is published semimonthly; monthly in July and August; and as a combined issue December 15/January 1 by CIO Communications Inc., 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. Periodicals postage paid at Framingham, MA, and at additional mailing offices. **Reprints:** Copyright 1996 by CIO Communications Inc. All rights reserved. Reproduction of material appearing in CIO is forbidden without written permission. Send all reprint requests to Permissions Department, CIO, 492 Old Connecticut Path, PO Box 9208, Framingham, Massachusetts 01701-9208. **Photocopy Rights:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CIO for users through the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Massachusetts 01970. Please specify: ISSN 0894-9301. Permission to photocopy does not extend to contributed articles followed by this symbol: \$. **Subscriptions:** Address inquiries to CIO, 492 Old Connecticut Path, P.O. Box 9208, Framingham, Massachusetts 01701-9208. CIO is free to qualified information executives. To all others the one-year basic rate is \$98 for U.S. and Canada, \$110 to foreign countries (payable in U.S. funds only). The single copy price is \$8. Please allow 4 to 6 weeks for new subscriptions to begin. **Change of Address:** Please fax a copy of current subscription label along with new address to (508) 872-8506. Allow 4 to 6 weeks for change to take effect. **Postmaster:** Send change of address to CIO, P.O. Box 489, Northbrook, Illinois 60065-9816.

Still scheduling by the book?



Consider an enterprise best seller...

Meeting Maker's strong client/server architecture is the foundation for providing a reliable group scheduling application that will support the small workgroup and scale to support an enterprise of hundreds to thousands of users. Check out these best selling features:

- ✓ True Client/Server Architecture Means Ultimate Scalability
- ✓ Cross-Platform Support Means Unparalleled 3-Tier Interoperability
- ✓ Runs on Windows, WinNT, Win95, PowerMac, Macintosh, OS/2, UNIX and DOS
- ✓ "Click & Drag" Scheduling Requires Little User Training
- ✓ Efficient Remote Access For Traveling Executives

Invest in an enterprise group scheduling solution. Invest in Meeting Maker.



**Client/Server, Cross-Platform Group Scheduling
for Mission-Critical Environments**

Call (800) 668-6083

for your free "Strategic Perspectives on Group Scheduling" Study

www.on.com/mm2p/mm2home.html



Working Smart

MAXIMIZING THE PAYOFF FROM INFORMATION TECHNOLOGY

DEALING WITH an unemployment office isn't fun, but it doesn't have to be a demoralizing exercise in bureaucracy either. When the Michigan Employment Security Commission (MESC) wanted to take some of the sting out of certifying unemployment claims, the Detroit-based agency turned to interactive voice response (IVR) technology. Using the system MESC co-developed with a vendor, claimants can quickly certify their eligibility for benefits over the phone. And by saving more than \$1 million a year in paper and labor costs, MESC hopes to offer more services designed to put people back to work.

According to state law, once Michigan residents file an initial claim for unemployment benefits, they have to certify continued eligibility every two weeks. In the past, a claimant filled out a form and mailed it to the local unemployment office, where a small army of staff members would open the mail and type the data into the state's mainframe-based unemployment database. If a claimant had a routine question, he or she would have to call a staffer, who would then access the mainframe using a terminal. It wasn't unusual for MESC's phone lines to be clogged with callers seeking basic information.

Now all that frustration is a distant memory. The Michigan Automated Response Voice Interactive Network, better known as MARVIN, has been streamlining the unemployment claims process statewide since December 1995. Claimants are assigned weekly one-hour windows of time on Mondays, Tuesdays or Wednesdays during which they can call MARVIN to certify their eligibility; they can call any time on Thursdays and Fridays. MARVIN handles approxi-

Michigan Employment Agency's Interactive Voice Response System

Vital Statistics:

- **Organization:** Michigan Employment Security Commission
- **Application:** Interactive voice response system
- **Technologies:** Unix-based system from Periphonics that runs IVR software and ties into an unemployment database on an IBM Customer Information Control System mainframe
- **Scope:** Implemented statewide at 54 branches
- **Sponsor:** Ken Washburn, manager of office technology and support
- **Objective:** Provide a convenient way for claimants to certify eligibility for unemployment benefits
- **Payback:** Saves the state \$200,000 in paper costs and at least \$1 million in labor costs annually

mately 50,000 calls a week. Claimants, who enter personal identification and Social Security numbers for authentication, also can use MARVIN to answer routine questions about when a check was mailed, how much it was for and how long benefits will be paid. Checks are now cut and sent the day after a certification call compared with several days after certification using the old system. And for 85 percent of claimants, MARVIN is a local phone call away.

Like many other state agencies bitten by the reengineering bug, MESC wanted

to make life easier for its clientele. "We wanted to turn MESC into a customer-friendly organization," says Director F. Robert Edwards. At the same time, the agency was facing the budget ax and needed to become more efficient. For a few years, MESC kept an eye on what other states' employment agencies were doing in the way of technology, says Ken Washburn, manager of office technology and support. IVR technology emerged as the most viable solution for a simple reason: Nearly everyone has a phone.

IVR gives people access to real-time claim information without making them wait for a staffer to answer the phone, and it can be integrated easily into an existing mainframe-based architecture.

The agency worked with Periphonics Corp. of Bohemia, N.Y., to develop a proprietary, Unix-based IVR system that essentially links the existing phone system to MESC's mainframe. Rather than set up an expensive, centralized, toll-free operation, MESC installed the system at 54 branch offices and added 800 phone lines.

MARVIN is already proving to be worth its \$3 million price tag. Since the system was implemented, it has handled roughly 5 million claims. Edwards estimates that MARVIN eliminates the use of 6.4 million forms, saving MESC \$200,000 per year in paper costs alone. And because unemployment is cyclical, officials say MESC has saved at least \$1 million by eliminating the need to hire temporary workers. "Even as claims peaked in the winter, we were able to carry on without a hitch," Edwards says. All this happened while the federal government was slashing MESC's budget by \$14 million.

Claimants like the convenience of the system, and so do MESC staff members, who now spend more time solving problems for people. —Megan Santosus

Designed for Microsoft BackOffice means your business applications will live together happily ever after.



You know how complicated it can be to get your new stuff to work with what you already have, considering all the software and hardware configurations you deal with every

day. To make your life easier, you need solutions that can get along. But how do you choose the ones that will? Microsoft has made it simple with one sure sign. Just look for the Designed for BackOffice™ logo, and you can count on the fact that that product will fit smoothly into your community of BackOffice applications, including Microsoft® Windows NT® Server. We can make that promise because we rigorously test each product to make sure it can meet a variety of requirements. Some of the best-known applications in the industry proudly bear the Designed for BackOffice logo. For a complete list of products, visit our website at www.microsoft.com/backoffice/designed/. Then your applications can work together, just like one big happy family.

Designed for BackOffice Logo Criteria

Server

- Must run as a Windows NT Server service
- Must support both IPX/SPX and TCP/IP
- Must support Windows® unified logon
- Must be installable using Systems Management Server
- Must support ISAPI if application is Internet related

Client

- Must support industry standards in each client category (ODBC, MAPI, for example)
- Must be installable using Systems Management Server
- Must have at least a 16-bit Windows-based client (Win32® client preferred)

Microsoft®

Where do you want to go today?® www.microsoft.com/backoffice/designed/

when it comes
to supporting
seamless multinational
networks . . .

cabletron

is essential

Introducing World/One

Do you think of your corporate network as spanning dozens of different countries? Or just one world?

Cabletron's World/One™ program can make your global network virtually seamless. A single entity, covering a single world. Because you've got more important things to do than worry about a lot of international differences, red tape, and roadblocks.

You get focused global support, and special tools and privileges to help you stay on top of your network from wherever you sit. Even access to a dedicated, secure web site with real-time information about all your business with Cabletron worldwide.

With Cabletron's World/One support orchestrating all the intricacies of your worldwide network, you're freer to use new technology to expand plants, R & D, marketing reach, etc. You can get to new markets, with new products, faster than you may have thought possible.

The World/One advantage. One seamless network. One view. One company can do it for you. Cabletron. Call (603) 332-9400 to learn more.



CABLETRON
SYSTEMS
The Complete Networking Solution™

The stuff **Intranets** are made of

SYNTHESIS